AUGUST 19, 1961

Chemical Week

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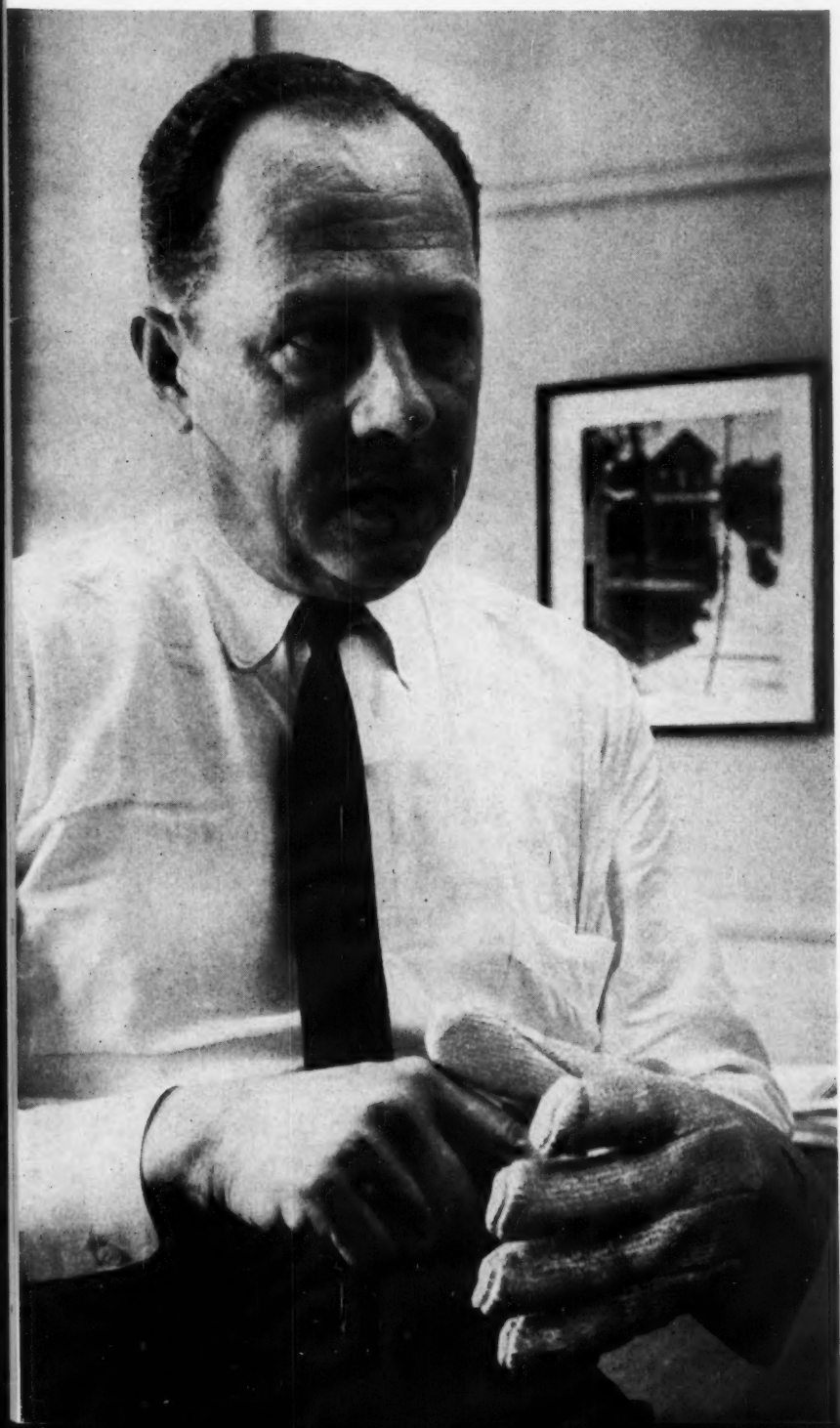

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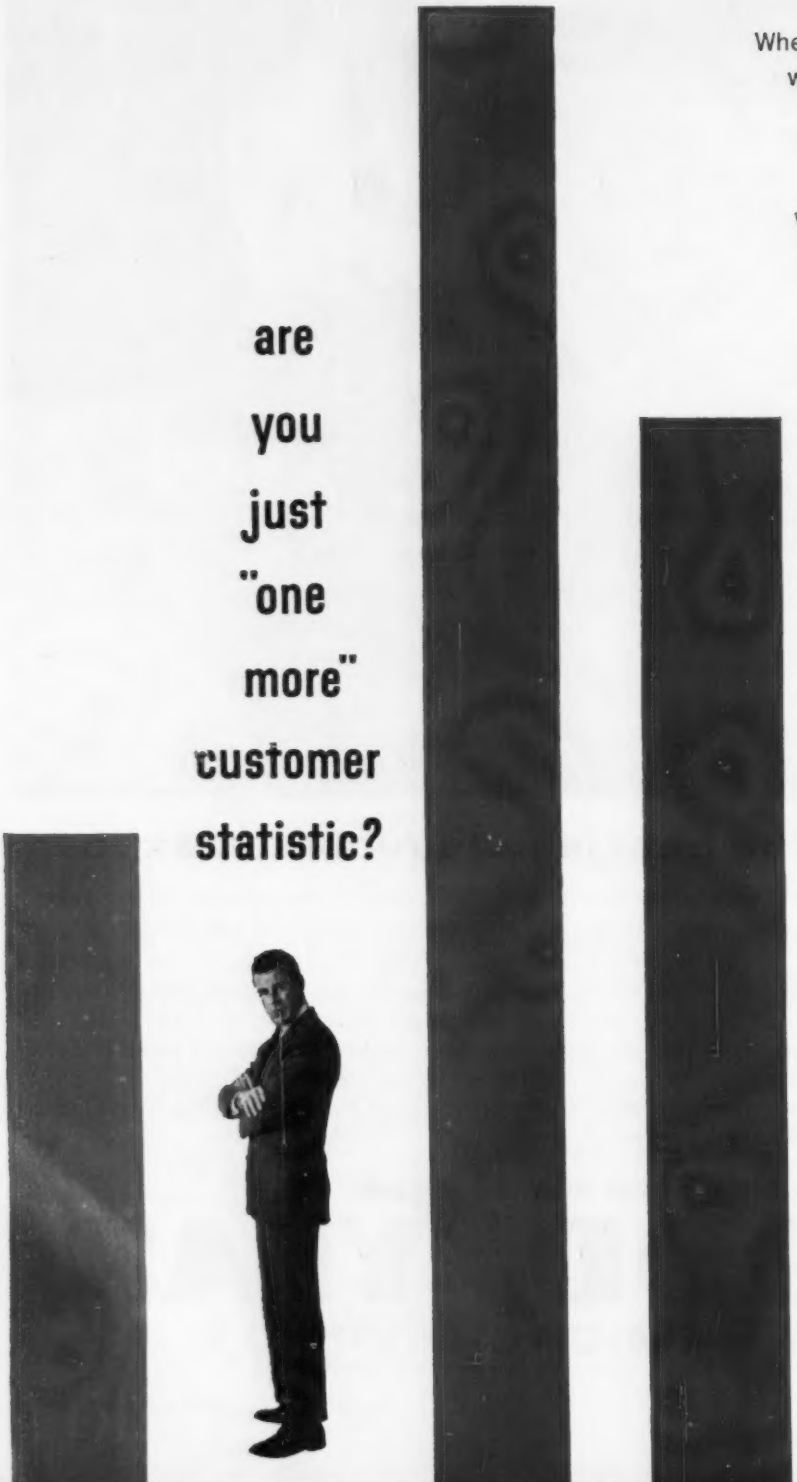

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ON THE COVER: Lee Gehman, president of Thermo-Chem Corp., pulls on a prototype welder's glove given heat reflectivity by his low-cost "aluminating" process for fibrous material (p. 57).

Chemical Week Vol. 89, No. 7 AUGUST 19, 1961

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PULP AND PAPER PROCESSING call for detailed knowledge of the behavior of essential chemicals. Diamond laboratories at Painesville, Ohio, exist for just this purpose. "Findings for paper" are applicable also in many other industries. Ray Norris is preparing a pulp pad for viscosity and alkali solubility.

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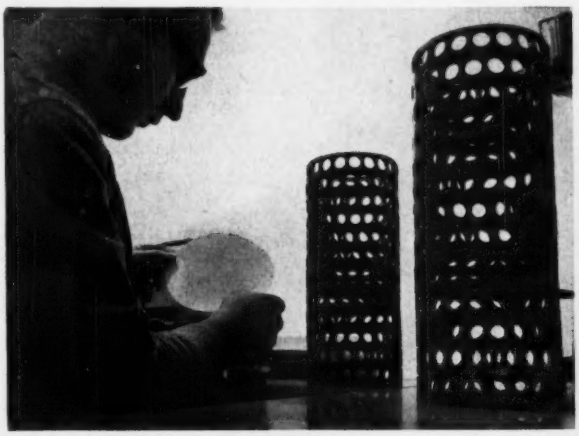
help solve your problems, too

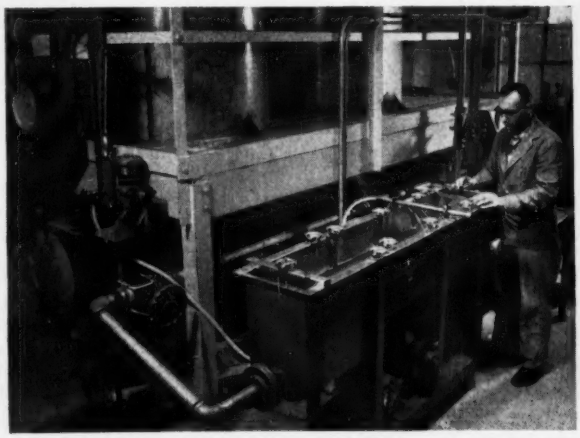
DIAMOND STAFF has ready access to needed instruments. This man obtains "freeness" on a Canadian Standard tester.

TEST PULP SAMPLE yields valuable answers to specialized technicians. This sample is from a 1½ lb. Valley Beater.

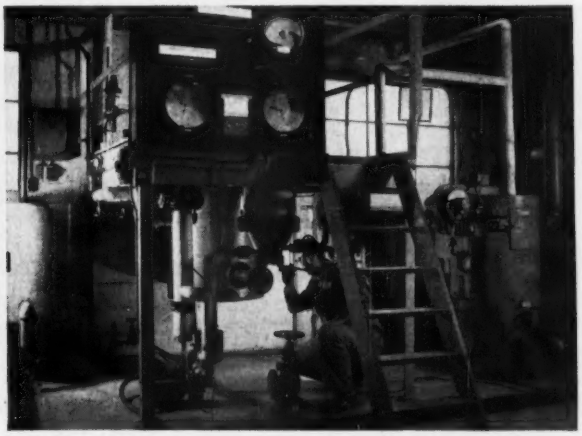


TEMPERATURE AND HUMIDITY are controlled in this lab where test sheets are placed on drying rings by Ed Halleck.

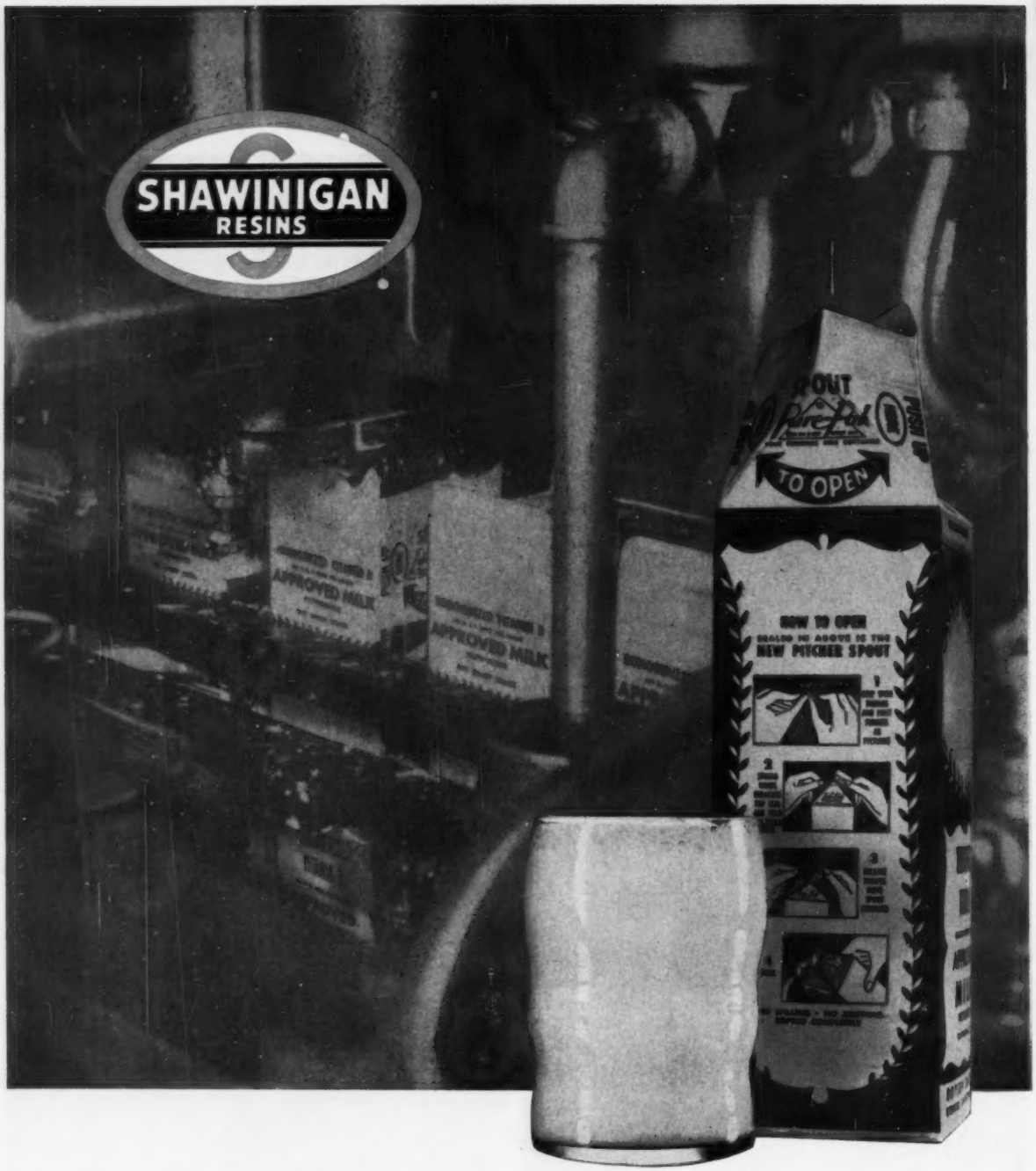
TENSILE-STRENGTH TEST on Model J Scott tester. Other lab men will determine crush resistance on fluted strip.



SCREENING PULP STOCK on a vibrating flat screen. Customers are busy *producing* while Diamond is "finding answers."



INSTALLING a blow valve on 2-cu. ft. capacity digester. Diamond technical staff and facilities are ready to serve all customers.



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Recipe for Prosperity

PRESIDENT KENNEDY'S tax credit proposal, even if it should become law in the highly modified version approved by House Ways & Means Committee, is still a halfway—or quarterway—measure, compared with real depreciation reform.

A survey conducted by the American Economic Foundation of the depreciation rates of the eight leading industrial nations of the Western world reveals a significant correlation between those rates and the twin economic indexes, rate of growth and level of unemployment:

Country	Depreciation allowance after five years (%)	Rate of economic growth since '53	Percent of unemployment
Japan	>100.00	258	1.1
Italy	100.00	181	5.4
West Germany	76.27	180	< 1.0
France	90.00	172	0.3
Sweden	100.00	134	1.7
England	65.63	128	1.6
Canada	66.25	127	11.1
U.S.	40.00	119	6.8

In general, those nations that encourage reinvestment in productive facilities through liberal depreciation allowances also rank highest in the scale of full employment and economic growth.

Other factors, of course, can modify the effectiveness of adequate depreciation allowances. In Italy, for instance, the chronic depression of the Southern agricultural region creates high unemployment despite liberal depreciation rates (which actually allow recovery of investment after four years). But in the past two years unemployment has been cut 30%—from 7.7% to 5.4%—largely through the nation's success at shifting its economy from an agricultural to an industrial base through stimulation of industrial investment. Since the war 8.5 million people have moved into industry.

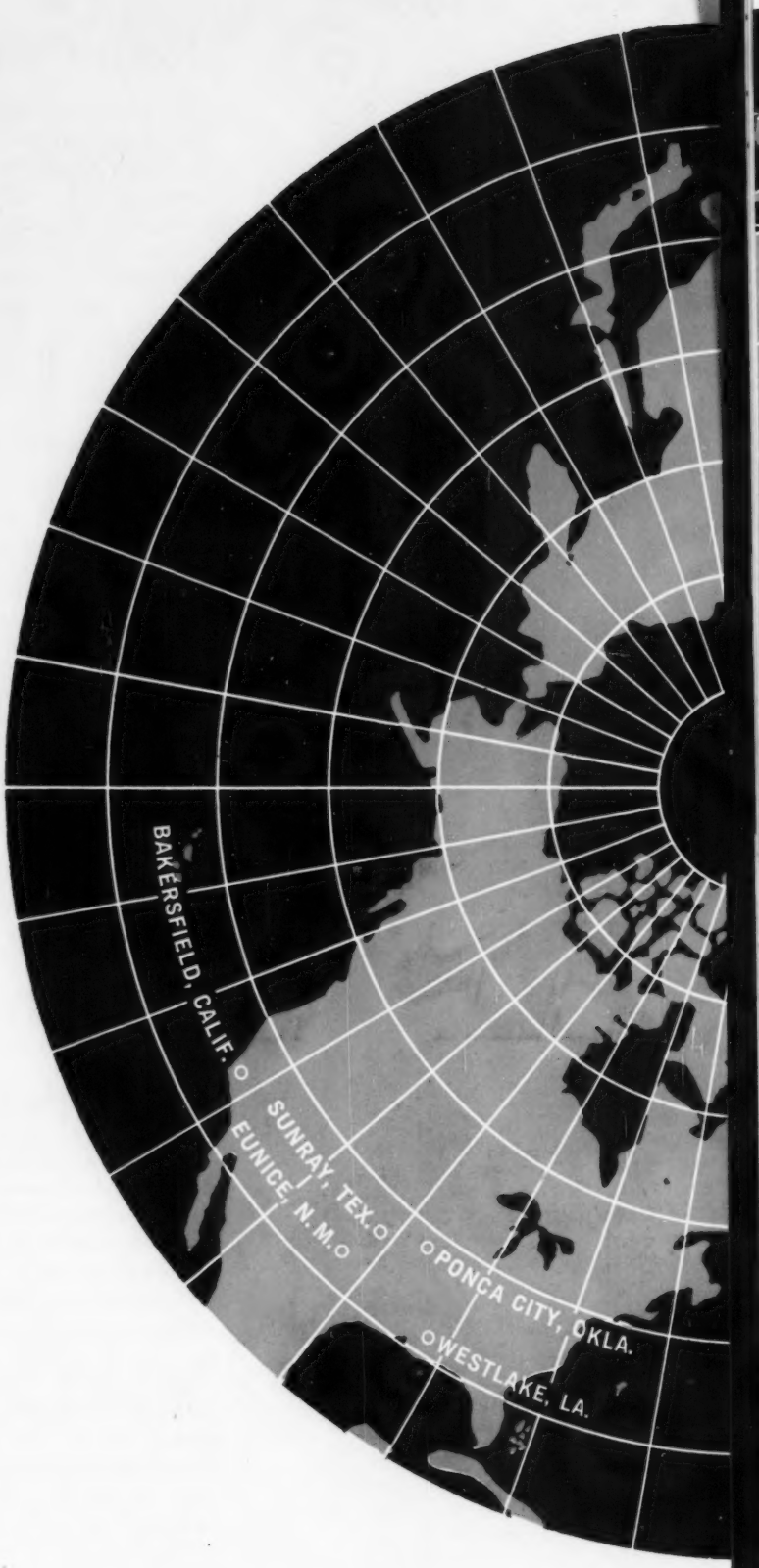
In Canada, on the other hand, the disproportionately high unemployment can't be blamed on relatively ungenerous depreciation rates—it stems more from effects of the recession in the U.S., with which Canada has close economic ties. But it's likely that a more generous depreciation policy would help boost employment by stimulating local industry.

West Germany—like Sweden an importer of labor—recently reduced its depreciation rate to brake a runaway boom. It's ironic that the rates adopted to slow the economy are still more generous than ours.

It would appear that Sweden, despite liberal depreciation, has not achieved remarkably rapid growth; but Sweden, unscathed by the war, started with a high level of industrialization, has maintained full employment, and has invested heavily in the social sector of the economy.

Despite the qualifications and special situations obtaining for each country, the fact remains that Japan, the country with the most generous allowances, ranks highest in growth and third best in unemployment; whereas the U.S., the country with the least generous allowances, ranks last in growth rate and second worst in unemployment.

The lesson? It's clear enough for any congressman who looks at the facts and for any businessman who wants to work through his elected representatives for a growing and prosperous America.



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LETTERS

Peroxide Patents

TO THE EDITOR: It is stated in the fifth paragraph of your article on organic peroxides (*July 22, p. 39*) that two of the manufacturers of di-tert-butyl peroxide have licenses under a Milas patent.

It is further implied that a nonlicensee may be subjected to legal action under the Milas patent. To clarify what appears to be an erroneous implication, I would like to point out that the patent you are undoubtedly referring to is No. 2,223,807, since that is the only Milas patent dealing with di-tert-butyl peroxide. Further, this Milas patent expired Dec. 3, '57. As a result, no one could be subjected to legal action under this patent for any reason. . . .

DAVID BUSCHMAN
President
U.S. Peroxygen Corp.
Richmond, Calif.

Liquid Atomization

TO THE EDITOR: Your recent article "Spraying With Sound Waves" (*July 15, p. 95*) is most interesting. I wish to point out the existence of an earlier disclosure of atomization by sonic vibrations I call the electromechanical atomizer (U.S. Patent 2,779,623). This atomizer is now entering a commercial development phase for small-scale applications and will certainly add to the new dimension in atomization your article referred to.

The relation of sonic vibrations to atomization is not really the new dimension, as the operation of any atomizing nozzle is associated with sonic disturbances, and for good reason. What is new is the utilization of resonant sonic vibrations to increase atomization efficiency and simultaneously narrow the droplet size distribution. The mechanical atomizer described in the above-mentioned article apparently derives its resonant condition from hydrodynamic feedback between an orifice and a resonator edge. In the electronic type, a "barnozzle" is a portion of a servo control loop wherein its resonant state is maintained by easily controlled electronic circuitry.

In regards to the over-all efficiency of atomizers, an additional factor not to be overlooked is the efficiency of inertial energy coupling between the atomizing member and the liquid to be atomized.

B. J. EISENKRAFT
Technical Manager
Spray Designs Co.
Brooklyn, N.Y.

Gentle to Fabrics

TO THE EDITOR: Compliments to you for your concise article on chlorinated cyanurics (*June 24, p. 161*).

I would like to point out one small but important error in the article, however. By implication you give the impression that it has not been established that commercial bleaches based on chlorinated cyanuric acid are more gentle to fabrics than conventional liquid hypochlorite bleaches. This fact has been firmly established by ourselves and others in the field.

Consequently we firmly endorse your closing statement that the prediction of a 40-million-lbs./year market within five years may prove conservative.

DON WILSON
President
Southland Chemical Co.
Los Angeles

Floor Polish Polymers

TO THE EDITOR: Concerning your article on floor finishes based on acid-soluble polymers (*July 22, p. 79*), there is a technical point that should be clarified.

Conventional waxes and finishes are normally cleaned with alkaline solutions. In the process, some of the coating may be removed. In many cases, this is a necessary feature of the cleaning process, since often the ground-in soil can be removed only if some of the matrix in which it is embedded is removed.

The question arises whether going to an acid-soluble polymer, in conjunction with acidic cleaners, really changes this situation. To get effective cleaning, it is apparently still necessary to remove some of the wax or finish.

The central point is, perhaps, that acidity and alkalinity are only secondary concepts in this problem. It is possible to remove a conventional wax or finish completely with a "neutral" stripper (pH less than 8). The governing factors are the matching of the cleaner to the finish, and exercising proper control over cleaner concentrations, temperature, contact time, etc. When this is done, excellent results can be obtained with conventional systems using proper maintenance techniques.

It may be that the acid-soluble polymers will demonstrate advantages over the existing systems. If so, we believe they will be due to properties other than acid solubility.

H. A. HARTUNG
IndaChemical
Camden, N.J.

'Unwarranted Intervention'

TO THE EDITOR: We would like to comment and add one extra point to your Viewpoint (*July 29, p. 5*) and the subject, "Frank Look at Drugs," by John T. Connor, president of Merck & Co.

I want to agree with the seven points Mr. Connor brings out, and I would like to add one point to his No. 5 paragraph, which states, "There is the problem of harassment and unwarranted intervention through legislation and regulation, etc."

Our company has been subjected to this harassment and unwarranted intervention in a very autocratic manner. We were requested to withdraw one of our products, not because of its chemical formulation but because of the name that the product was sold under.

The Food & Drug Administration claimed that the layman was unable to diagnose a simple type of skin eruption, and when adequate medical proof was submitted to FDA authorities, their only reaction was, "It is our opinion." When we requested FDA to clarify the statement, "It is our opinion," and to submit to us adequate

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

proof that its opinion was well-founded, it refused to do so and answered our request in a simple statement, "It is our opinion that we are right and that you are wrong."

If additional unwarranted legislation and regulation is increased, and the Food & Drug Administration is given unlimited power to absolutely regulate the drug industry without being required to state its position authentically and with reliable data, then the drug industry might as well close up shop . . . .

We certainly applaud Mr. Connor for stating . . . that certain other legislative proposals now pending before federal and state bodies, if enacted into law, would severely hamstring the industry without significantly greater protection for the public.

RAY SHAWCROSS
President
R&S Chemical Co., Inc.
Portland, Ore.

Too Gloomy on Vinyl?

TO THE EDITOR: Your vinyl chloride report (*July 29, p. 59*) is basically a good, accurate picture of the current situation. I do believe, however, that the long-range outlook may not be as gloomy as your forecast.

ARTHUR PHILLIPS, JR.
Vice-President
Solvay Process Division
Allied Chemical Corp.
New York

Oxy Peroxides

TO THE EDITOR: We were somewhat dismayed by the exclusion of Oxy Chemical Co. from the list of organic peroxide manufacturers (*July 22, p. 39*).

To paraphrase your article, we feel we are also "one of the small but scrappy competitors edging into peroxide manufacture." . . . You recently recognized our new peroxide catalyst for silicones, Silox B . . . (*CW Technology Newsletter, May 6*).

Oxy manufactures benzoyl peroxide in all its commercial forms and markets them under its Benox tradename. We also have great expectations for our series of Silox silicone catalysts. Besides offering MEK peroxide and a number of what can be considered custom-made specialty peroxides, we will soon enter the peroxide race to capture the new cross-linked polyolefin market.

RICHARD E. HUBER
Vice-President
Oxy Chemical Co.
Nixon, N.J.

MEETINGS

Gordon Research Conferences, Colby Junior College, New London, N.H.—Aug. 21-25, food and nutrition; Aug. 28-Sept. 1, cancer; **New Hampton School, New Hampton, N.H.**—Aug. 21-25, inorganic chemistry; Aug. 28-Sept. 1, adhesion; **Kimball Union Academy, Meriden, N.H.**—Aug. 21-25, photonuclear reactions; Aug. 28-Sept. 1, high-temperature chemistry—molten salts.

United Nations Conference on New Sources of Energy, Ciro Massino, Rome, Italy, Aug. 21-31.

Wayne State University, international conference on coordination chemistry, Detroit, Aug. 21-Sept. 1.

Western Electronics Show and Conference, Cow Palace Hotel, San Francisco, Aug. 22-25.

American Rocket Society, fourth biennial gas dynamics symposium, Northwestern University, Evanston, Ill., Aug. 23-25.

Mathematical Assn. of America, summer meeting, Oklahoma State University, Stillwater, Aug. 28-31.

American Society of Mechanical Engineers, international conference on heat transfer, University of Colorado, Boulder, Aug. 28-Sept. 1.

The Metallurgical Society of American Institute of Mechanical Engineers, technical conference on the metallurgy of semiconductor materials, Ambassador Hotel, Los Angeles, Aug. 30-Sept. 1.

Technical Assn. of the Pulp and Paper Industry, 11th corrugated containers conference, St. Francis Hotel, San Francisco, Sept. 6-8.

The Combustion Institute, Western states section, 1961 fall meeting, University of California, Berkeley, Sept. 7-8.

Chemical Market Research Assn. meeting, Lake George Sagamore Hotel, Bolton Landing, N.Y., Sept. 10-12.

Instrument Society of America, 16th annual instrument-automation conference and exhibit, Biltmore Hotel, Los Angeles, Sept. 11-15.

Southeastern Plant Engineering and Maintenance Seminar, third annual, Town Hall, Greensboro, N.C., Sept. 12-14.

Conference on new-product development in the field of high-polymer coatings, Engineering Extension at the University of California, UCLA campus, Sept. 12-15.

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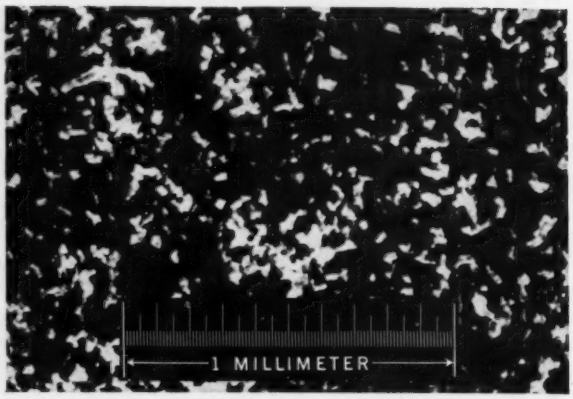
42 Mesh	Trace	200 Mesh	35.0%
100 Mesh	.5%	325 Mesh	70.0%
170 Mesh	20.0%	400 Mesh	80.0%



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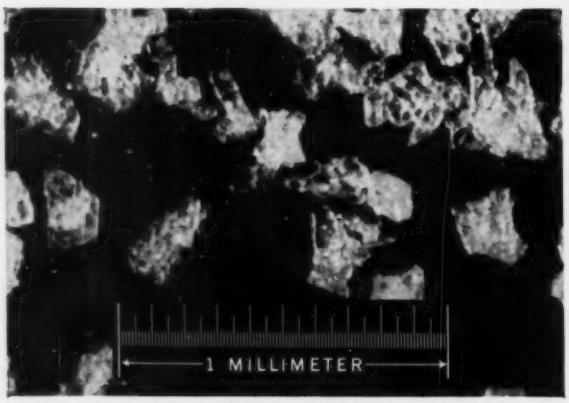
200 Mesh	2.0%	400 Mesh	45.0%



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42 Mesh	Trace	100 Mesh	92.5%
65 Mesh	27.0%	170 Mesh	99.0%
80 Mesh	66.5%		

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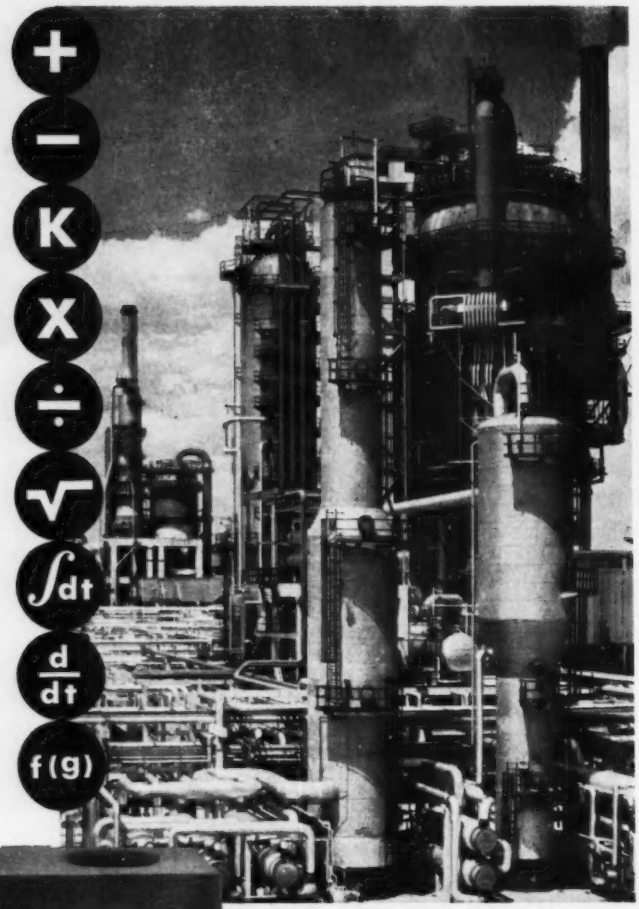
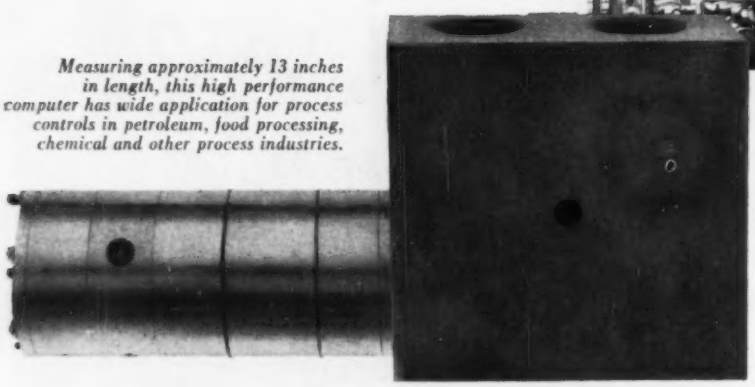
AiResearch introduces pneumatic computer to the process industry





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Business Newsletter

CHEMICAL WEEK
August 19, 1961

Foreign investment by U.S. chemical firms will rise further next year. This is the latest estimate of the Commerce Dept.'s Office of Business Economics. In the chemicals and allied products area, U.S. companies spent $237 million on plant and equipment abroad in '60, which was lower than anticipated. They will spend an estimated $288 million in '61 and will lay out an anticipated $301 million in '62.

Plant and equipment expenditures in paper and allied products are expected to drop from about $79 million this year to $73 million in '62. But officials forecast a slight rise in such spending among rubber products firms—from $71 million in '61 to an estimated $74 million next year.

For the manufacturing industries as a whole, spending is slated to rise from $1.34 billion this year to $1.76 billion in '61, then to slip a bit to $1.71 billion in '62. Outlays in Canada are slated to drop from $384 million in '60 to $371 million in '61 and $378 million in '62. Latin America received $207 million last year, will receive $291 million in '61, $257 million in '62; Europe, $608 million in '60, $902 million in '61 $862 million in '62.

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A $10-million Canadian potash expansion is in the works for International Minerals & Chemical's Saskatchewan project. The new expenditure raises IMC's total plant investment in its Canadian subsidiary's spread there to nearly $40 million, will hike output potential from 420,000 tons/year to about 1.2 million tons. Production at the latter rate should begin in Jan. '63.

Company officials expect demand for North American agricultural potash to begin rising at an average annual rate of 6.5% by the time the new installation starts producing.

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Out this week are details of a Canadian aluminum expansion. The long-contemplated program by Canadian British Aluminum (*CW, May 13, p. 26*) calls for spending about $36 million to add another potline to its Baie Comeau smelter. Capacity will be increased 50%, from a present 90,000 tons/year, to 135,000 tons.

This may not be the last aluminum expansion for CBA; when the plant was built, the company indicated that provision was being made for an expansion to 180,000 tons/year.

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Full tilt into chemicals production is the order-of-the-day at Baird Chemical Industries (New York). Hints on its first chemical manufacturing venture, Sorbitol (*CW Business Newsletters, Apr. 1; Jun. 10*), are being padded out by the company. Contract for the design and construction of a $1.5-million, 20-million-lbs./year plant has gone to Badger

Manufacturing (Cambridge, Mass). Plant will be on a 40-acre site—ample for Sorbitol expansion and other chemical projects—in Peoria, Ill., along the Illinois River section of the inland waterway.

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Baird Chemical's plan to acquire Barlow Chemical (Ossining, N. Y.) has been approved by directors of both companies. If Barlow stockholders approve the transaction—voting will take place within three weeks—the acquisition will be made on a cash basis.

Barlow is a 10-year old manufacturer of quarternary Ammonium compounds (Barquat), and tertiary amines (Barlene).

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Another step has been taken by American Cyanamid toward becoming a significant factor in methyl methacrylates. The firm will build a molding powder plant at its plastics and resins complex in Wallingford, Conn. No details on size of the undertaking have been made public, but the unit will probably cost about $3 million, be able to turn out at least 5 million lbs./year.

Cyanamid will manufacture the molding powder under a license obtained in February from Imperial Chemical Industries (Great Britain). A few month ago (*CW Business Newsletter, Apr. 8*) the company acquired all the business and assets of Wasco Chemical and six subsidiaries; Wasco is a leading manufacturer and distributor of methyl methacrylate cast sheet and molded products. With know-how and an assured marketing set-up, integration backward to the powder was a natural.

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Report on the Cubatao, Brazil, Alkali venture (*CW Business Newsletter, May 20*) was confirmed earlier this week by Diamond Alkali. The company's wholly owned subsidiary, Diamond Alkali International, says the "largest" electrolytic caustic-chlorine plant in South America will go onstream in '63. Design capacity is 90 tons/day of chlorine, 100 tons/day caustic.

There are built-in provisions to double this production, and plans include upgrading chlorine into related products. The operation is in partnership with two Brazilian industrial groups.

•

A new chairman of the board for Virginia-Carolina Chemical: David K. Wilson, president of Cherokee Insurance Co. (Nashville, Tenn.). Justin Potter, V-C's chairman and president for the past three years, remains president and chief executive officer.

V-C's expansion program and plans for growth, says Potter, make it "desirable for me to share some of my increasing responsibilities." Potter, incidentally, is chairman of Cherokee Insurance, is a long-time business associate of Wilson.

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Imports, Exports: High at Half Year

Chemical exports continued to climb during first-half '61, but there were signs that this long-term uptrend may be losing momentum. On the other hand, chemical imports have held close to their year-ago growth rate despite the recession that lingered into spring.

Exports still account for more than 80% of this country's international trade in chemicals and allied products, according to data by the Commerce Dept. last week. But while chemical exports enjoyed a zestful 15.4% pick-up in first-half '60, their rate of increase during first-half '61 tapered off to a modest 2.7%; and there were decreases in shipment totals for many of this nation's biggest chemical export commodities *(table, p. 23)*.

Peak Reached: One big-volume group of chemical exports that appears to have about reached its peak: synthetic resins. There were drops in shipments of alkyd, amine, ion-exchange and certain vinyl resins during first-half '61, compared with first-half '60, and also in certain films and laminates of synthetic resins. The two biggest-volume export resins — polyethylene and polystyrene — both achieved slight increases in quantity of exports, but only at the cost of lower valuations. Shipments of all principal types of synthetic rubbers were off.

Exports of most major types of fertilizers declined, but urea and concentrated superphosphate scored gains. Export volume dropped for numerous petrochemicals—e.g., ethylene glycol, propanol; and the big boom in carbon black exports may have passed its zenith. Among inorganic exports that were off: boric acid and borates, titanium pigments, and soda ash.

Reason for the export declines are easy to ascertain. Dozens of new chemical and petrochemical plants—many owned or partly owned by U.S. chemical companies—have been coming onstream in all major foreign market areas. Most of these are designed not only to supply local needs but also to compete in other nearby nations. The improvement in U.S. business since March has strengthened domestic markets; and the shipping industry strike in June postponed some chemical shipments.

Total U.S. exports in first-half '61 increased by 1.5%, to $10.4 billion. Imports totaled $6.9 billion.

While six-month tabulations are not infallible guides to trade trends on individual commodities, chemical product totals are more reliable trend-lines. And it's of interest to note that the 9.5% rise in chemical imports during first-half '61 contrasted with a 10.2% drop in all U.S. imports in the same period.

FIRST-HALF CHEMICAL IMPORTS

(Quantity and value figures in millions. Quantity in pounds unless otherwise stated. Computed by Chemical Week from U.S. Dept. of Commerce foreign trade statistics.)

Commodity	Quantity	Change from first-half '60	Value	Change from first-half '60
Benzene (gallons)	9.3	— 55.7%	$ 2.5	— 50.6%
Naphthalene	61.2	+175.6%	7.2	+367.2%
Phthalic anhydride	4.1	+ 20.3%	0.8	+ 40.3%
Alizarin and other coal-tar colors, dyes and stains	2.0	+ 4.6%	6.3	+ 19.1%
Caffeine	0.87	+103.2%	1.8	+125.1%
Menthol, natural	0.7	+ 66.0%	4.7	+ 98.6%
Menthol, synthetic	0.1	+ 1.1%	0.6	+ 28.2%
Trichloroethylene	18.1	— 43.4%	1.3	— 42.0%
Vinyl acetate monomer	20.4	— 9.8%	3.3	— 14.7%
Polyvinyl acetate	1.2	+ 45.6%	0.5	+ 36.8%
Polyvinyl chloride and copolymers	2.6	— 70.3%	0.44	— 70.0%
Tartaric acid, anhydride	2.6	+ 58.8%	0.8	+ 46.1%
Chloroacetic acid, anhydride	4.8	— 6.4%	0.7	— 10.6%
Ethyl alcohol (gallons)	17.7	+ 38.3%	3.8	+ 30.9%
Glycerin	10.6	+ 66.8%	1.43	+ 31.3%
Sodium sulfate, crude (long tons)	0.09	+ 24.1%	2.06	+ 26.3%
Sodium cyanide	9.1	+ 3.9%	1.2	+ 1.1%
Aluminum hydroxide for aluminum production	196.4	+143.3%	5.9	+121.6%
Perchloroethylene	16.2	+ 39.7%	1.3	+ 40.3%
Chlorine	19.5	— 25.9%	0.7	— 28.7%
Germanium dioxide and metal	0.02	+ 71.2%	1.5	+ 51.4%
Furfural	14.3	— 11.1%	1.6	+ 4.1%
Titanium potassium oxalate and compounds	9.1	+ 85.4%	1.8	+ 74.2%

Commodity	Quantity	Change from first-half '60	Value	Change from first-half '60
Ammonium sulfate (tons)	0.135	— 11.5%	4.7	— 11.6%
Ammonium nitrate (tons) (over 32% nitrogen	0.08	— 14.2%	4.6	— 12.6%
Ammonium nitrate (tons) (not over 32% nitrogen)	0.07	+ 76.1%	2.9	+ 94.9%
Nitrogen solutions (tons)	0.04	+ 39.4%	1.9	+ 45.9%
Calcium nitrate (tons)	0.06	+ 37.9%	1.9	+ 57.3%
Sodium nitrate (tons)	0.3	+ 31.2%	9.4	+ 25.2%
Urea (tons)	0.054	+ 17.8%	4.56	+ 14.7%
Ammonium-phosphate fertilizers (tons)	0.05	— 25.6%	3.4	— 23.0%
Other synthetic nitrogen fertilizers (tons)	0.02	— 39.2%	1.27	— 39.8%
Phosphates, crude (tons)	0.086	+ 17.5%	2.1	+ 10.5%
Potash, crude (tons)	0.2	+ 9.1%	6.1	+ 17.0%
Potassium sulfate (tons)	0.05	+ 25.2%	1.9	+ 24.2%
Compounded fertilizers (tons)	0.057	+ 23.5%	3.2	+ 19.5%
Synthetic rubber	12.6	+ 12.0%	3.2	+ 7.9%
Fluorspar, acid-grade (long tons)	0.16	+ 10.7%	5.7	+ 5.9%
Sulfur (long tons)	0.355	— 1.3%	7.5	+ 0.2%
Bauxite (long tons)	4.5	— 5.6%	38.7	— 0.6%
Mercury	0.32	— 51.2%	0.73	— 53.1%

FIRST-HALF CHEMICAL EXPORTS

(Quantity and value figures in millions. Quantity in pounds unless otherwise stated. Computed by Chemical Week from U.S. Dept. of Commerce foreign trade statistics.)

Commodity	Quantity	Change from first-half '60	Value	Change from first-half '60
Benzene (gallons)	20.3	+ 81.0%	$ 7.9	+ 71.9%
Toluene	120.8	— 44.4%	3.1	— 44.2%
Phenol	14.8	— 26.8%	1.85	— 42.2%
Cresylic acid, cresols	12.5	+149.3%	1.7	+163.4%
Phthalic anhydride	1.67	— 83.3%	0.34	— 84.8%
Phthalic esters, dibutyl	0.1	+ 93.1%	0.033	+ 93.6%
Phthalic esters, dioctyl	3.4	+ 3.5%	0.9	+ 4.7%
Other phthalic esters	25.2	+ 19.9%	10.1	+ 11.9%
Styrene monomer	57.7	— 22.5%	6.5	— 30.4%
Accelerators, rubber-compounding, cyclic	2.0	— 2.5%	1.4	+ 1.2%
Antioxidants, rubber-compounding, cyclic	6.6	+ 14.1%	4.65	+ 17.5%
Color lakes and toners, cyclic	1.2	— 9.8%	2.2	— 18.1%
Other cyclic dyes and stains	4.9	— 3.6%	9.5	+ 10.6%
Photographic chemicals, cyclic	0.35	— 39.5%	0.9	+ 1.3%
Vitamins and vitamin preparations	—	—	15.9	+ 2.6%
Hormones, derivatives, etc.	—	—	15.2	+ 1.2%
Antibiotics and compounds	—	—	46.1	— 2.3%
Copper sulfate	12.1	+ 52.4%	1.24	+ 22.1%
DDT, technical	6.16	+ 57.3%	1.25	+ 42.9%
DDT formulations, over 75%	55.4	+ 11.0%	13.9	— 15.3%
DDT formulations, 20-74%	1.7	— 2.7%	0.76	— 0.4%
Herbicides, 2,4-D and 2,4,5-T	5.8	+ 6.1%	2.8	+ 1.5%
Other herbicides	9.05	+ 77.0%	5.37	+ 87.2%
Agricultural sulfur	12.55	+ 75.6%	0.3	+ 65.6%
Insecticides, over 15% organic phosphate	4.9	+ 1.1%	3.54	+ 2.2%
Insecticides, over 15% polychloride	35.9	+ 62.1%	10.9	+ 31.1%
Other farm insecticides and formulations	28.8	+ 36.8%	6.8	+ 40.2%
Fungicides	10.44	— 0.5%	6.05	+ 3.4%
Fumigants	2.24	— 4.4%	0.66	— 7.4%
Household and industrial insecticides, pesticides	9.8	— 7.9%	3.3	— 2.4%
Disinfectants	4.4	— 18.8%	2.1	— 11.2%
Textile specialty compounds	13.8	— 6.8%	4.7	— 5.5%
Metal-working compounds	13.7	— 5.6%	2.45	— 2.7%
Ester gums	5.86	+ 15.3%	1.85	+ 47.2%
Polystyrene resins	69.1	+ 0.3%	16.4	— 0.3%
Alkyd resins	15.4	— 26.0%	4.9	— 24.0%
Vinyl resins, uncompounded	20.8	+ 4.0%	6.2	+ 4.2%
Vinyl resins, compounded	16.6	+ 37.6%	4.7	+ 19.0%
Vinyl resins, semi-finished	0.9	— 46.7%	0.77	— 15.1%
Tar-acid resins	13.1	+ 6.5%	4.4	+ 5.0%
Urea and other amine resins	12.05	— 3.4%	3.95	— 10.4%
Polyethylene resins	164.7	+ 0.2%	39.34	— 18.3%
Acrylic and methacrylate resins	10.6	+ 15.5%	3.5	+ 13.5%
Ion-exchange resins	4.3	— 14.2%	2.2	— 21.4%
Other synthetic resins	30.6	+ 33.8%	14.1	+ 33.5%
Detergent alkylates	39.7	+ 31.1%	4.6	+ 33.2%
Detergent intermediates	5.5	— 5.5%	0.7	— 26.0%
Detergents, all types	40.95	+ 15.4%	8.33	+ 5.2%
Surface-active agents	17.5	— 3.1%	4.43	— 2.0%
Cleaning, washing compounds	18.1	— 17.6%	3.9	— 6.0%
Rubber-compounding agents, except cyclic	35.4	— 17.0%	2.4	— 8.8%
Antiknock compounds	40.05	+ 53.2%	14.05	+ 55.8%

Commodity	Quantity	Change from first-half '60	Value	Change from first-half '60
Oil additives	—	—	30.1	+ 40.5%
Radioactive isotopes (curies)	0.1	+ 16.4%	0.9	+ 30.0%
Hydraulic fluids (gallons)	1.2	+ 3.8%	3.3	+ 11.3%
Methanol (gallons)	11.4	— 3.9%	2.3	— 2.1%
Ethylene glycol	29.7	— 57.2%	3.26	— 59.4%
Butanol	41.5	— 3.0%	5.0	— 13.6%
Glycerin	7.24	— 25.2%	1.61	— 35.2%
Ethyl alcohol (gallons)	5.8	+ 85.6%	2.1	+ 96.9%
Propyl alcohol	5.0	— 48.0%	0.37	— 79.2%
Other alcohols, glycols	56.1	— 22.0%	10.5	— 19.6%
Acetone	7.24	+ 64.1%	0.5	+ 32.8%
Butyl acetate	17.3	+ 19.3%	2.2	+ 17.0%
Cellulose nitrate	3.54	— 7.1%	1.6	— 7.6%
Methyl ethyl ketone	3.23	— 19.7%	0.45	— 22.9%
Organofluorine compounds	7.1	+ 11.7%	2.7	+ 14.7%
Ethylene diamine	2.8	— 31.6%	1.1	— 32.2%
Calcium hypochlorite	1.8	— 25.1%	0.5	— 19.6%
Calcium chloride	26.9	— 6.3%	0.6	+ 8.2%
Bromine and compounds not listed separately	5.3	— 1.3%	1.6	+ 2.7%
Boric acid and borates	277.8	— 9.2%	12.0	— 7.8%
Soda ash	128.4	— 19.4%	2.0	— 26.2%
Sodium chromate, bichromate	8.3	— 24.8%	1.0	— 24.4%
Sodium cyanide	4.93	+430.4%	0.93	+347.2%
Caustic soda, solid	126.6	— 0.3%	3.7	— 14.1%
Caustic soda, liquid	88.3	— 0.3%	2.0	— 20.2%
Sodium tripoly-phosphate	32.7	+ 49.9%	2.54	+ 44.3%
Other sodium phosphates	17.85	— 8.0%	1.82	+ 8.0%
Sodium sulfate	28.2	+ 43.7%	0.44	+ 31.2%
Chlorine	28.94	+ 21.7%	0.8	+ 17.2%
Other compressed gases	—	—	0.95	— 13.7%
Carbon black, contact	71.4	— 6.0%	8.4	— 3.3%
Carbon black, furnace	200.2	— 0.9%	16.5	— 0.8%
Titanium dioxide, other titanium pigments	32.5	— 10.7%	4.7	— 12.0%
Ready-mixed paints, stains and enamels	2.04	— 11.9%	7.9	— 5.5%
Inks and varnishes for printing, lithography	8.35	+ 27.3%	2.6	+ 5.0%
Ammonium sulfate	106.6	— 34.6%	1.83	— 28.5%
Ammonia	79.4	— 13.5%	3.2	— 5.6%
Ammonium nitrate	38.3	— 15.2%	1.3	— 6.8%
Urea	99.6	+154.8%	4.54	+183.5%
Florida phosphate rock (tons)	1.8	— 16.7%	13.9	— 13.8%
Other phosphate rock (tons)	0.36	+ 27.2%	3.35	— 2.8%
Normal superphosphate (tons)	0.073	— 14.5%	1.46	— 11.0%
Concentrated superphosphate (tons)	0.16	+ 41.3%	9.24	+ 44.7%
Potash (tons)	0.34	— 6.0%	11.9	+ 16.7%
Ammonia-phosphate type fertilizers (tons)	0.047	+ 32.5%	4.3	+ 72.2%
Mixed fertilizers (tons)	0.045	+ 51.8%	3.3	+ 34.5%
SB synthetic rubber, solid	230.6	— 25.8%	48.4	— 27.8%
Butyl synthetic rubber	24.9	— 5.1%	5.8	— 3.1%
Neoprene synthetic rubber	49.3	— 18.0%	21.3	— 18.6%
N-type synthetic rubber	9.1	— 4.7%	4.5	+ 7.9%
Rayon high-tenacity filament yarn, cord, etc.	18.0	+ 67.6%	10.5	+ 53.1%
Nylon filament yarn, tire cord, etc.	15.4	— 24.8%	25.7	— 22.5%
Acetate staple and tow	9.8	+ 17.3%	4.64	+ 16.8%
Silicon carbide abrasive	13.15	+118.1%	2.2	+ 76.9%
Sulfur, crude (long tons)	0.78	— 8.8%	17.0	— 17.9%

First-Half Earnings—the Returns Are Varied

This week brought sales and earnings data from two late-reporting chemical companies, American Agricultural Chemical and Virginia-Carolina Chemical. And these, vitrually completing the first-half returns list, indicate that the recent recession was highly uneven in its effects on this industry.

It's true that the 15 largest chemical companies making first-half reports were unanimous in listing lower net income for the six months as a whole *(table, below)*. But a sprinkling of chemical and other CPI companies—particularly among pharmaceutical producers—are ahead of year-ago performances in six-month, nine-month or 12-month earnings; and many posted gains in second-quarter profits.

One sampling—based on figures from 25 leading chemical firms—shows second-quarter earnings down 6% from last year's second quarter, but up 24% from dismal first-quarter '61. This sampling—compiled by First National City Bank of New York—shows first-half chemical profits off 13% from year-ago levels, with earnings for all manufacturing industries off 14%.

Varying vulnerability to the past recession accounted for few changes in the "standings" within the chemical industry. In ranking based on first-half sales volume, Stauffer Chemical advanced one notch, as did Du Pont of Canada and Metal & Thermit. National Starch and Nopco Chemical each passed a pair of rivals. Air Products and Chemicals has gained ground through its own sales efforts and through its consolidation with Southern Oxygen. Oil companies report their chemical sales only at year-end.

Chemical company executives now see a bright outlook for '61 as a whole, with the sales surge rolling on into August with only a seasonal let-up. But it's clear that profitability won't rebound to its more satisfying levels of '59 for months to come.

(All dollar figures in millions)

Chemical and Specialty Companies	SALES		EARNINGS		PROFIT/SALES RATIOS	
	1st half 1961	*Change from 1st half '60*	*1st half 1961*	*Change from 1st half '60*	*1st half 1961*	*1st half '60*
Du Pont	$1,075.9	Down 1.9%	$123.8	Down 9.0%	11.5%	12.4%
Union Carbide	747.5	Down 3.1%	69.4	Down 14.5%	9.3%	10.5%
Monsanto Chemical	465.7	Up 1.1%	34.6	Down 9.8%	7.4%	8.3%
Allied Chemical	379.9	Down 5.3%	25.7	Down 16.9%	6.8%	7.7%
Olin Mathieson	349.7	Up 0.4%	14.4	Down 22.8%	4.1%	5.4%
American Cyanamid	300.9	Down 1.4%	23.7	Down 16.5%	7.9%	9.3%
Hercules Powder	182.2	Up 9.3%	13.3	Down 0.5%	7.3%	7.9%
Celanese Corp.	133.5	Down 2.9%	8.6	Down 14.3%	6.5%	7.3%
Stauffer Chemical	118.7	Up 3.8%	9.4	Down 12.7%	8.0%	9.5%
Rohm & Haas	110.5	Down 4.9%	9.7	Down 20.5%	8.8%	10.5%
Air Reduction	98.6	Down 4.5%	5.7	Down 27.5%	5.8%	7.6%
Canadian Industries Ltd.	88.3	Down 3.5%	3.5	Down 22.4%	4.0%	4.9%
General Aniline & Film	81.0	Up 0.6%	2.9	Down 18.3%	3.6%	4.5%
Hooker Chemical	73.0	Down 2.7%	5.7	Down 10.7%	7.8%	8.5%
Diamond Alkali	67.0	Down 6.3%	4.7	Down 25.8%	7.1%	8.9%
Du Pont of Canada	53.6	Up 7.6%	4.0	Up 8.6%	7.5%	7.4%
Reichhold Chemicals	51.5	Down 0.7%	0.04	Down 97.5%	0.1%	2.7%
Witco Chemical	51.1	Up 6.9%	1.6	Up 3.3%	3.1%	3.2%
Pennsalt Chemicals	47.5	Up 0.8%	2.85	Up 7.4%	6.0%	5.6%
Wyandotte Chemicals	46.7	Up 0.2%	1.7	Down 15.2%	3.7%	4.3%
Atlas Chemical	40.3	Up 0.3%	2.2	Down 7.0%	5.5%	5.9%
National Starch and Chemical	32.8	Up 7.2%	1.9	Up 12.3%	5.7%	5.5%
Commercial Solvents	30.9	Down 7.7%	0.94	Down 21.0%	—	3.5%
Devoe & Raynolds	32.6	Down 5.1%	2.84	Up 8.6%	8.7%	7.6%
Sun Chemical	30.2	Up 4.1%	0.4	Down 36.0%	1.3%	2.1%
Heyden Newport Chemical	29.8	Down 2.5%	1.4	Down 22.0%	4.8%	6.0%
Stein, Hall & Co.	29.0	Down 2.6%	0.4	Down 23.6%	1.5%	1.9%
Nalco Chemical	26.0	Up 1.8%	2.4	Up 0.7%	9.3%	9.4%
Nopco Chemical	23.1	Up 12.9%	0.85	Down 8.3%	3.7%	4.5%
Pittsburgh Coke & Chemical	22.9	Down 34.0%	— 0.6	—	—	3.2%
American Potash & Chemical	22.8	Down 13.8%	2.14	Down 18.3%	9.4%	9.9%
Metal & Thermit	21.0	Up 7.7%	0.73	Up 15.7%	3.4%	3.2%
Texas Butadiene & Chemical	20.5	—	1.6	—	7.6%	—
Mallinckrodt Chemical	17.0	Down 10.2%	0.36	Down 43.3%	2.1%	3.4%
Canadian Chemical	14.3	Down 0.2%	0.8	Down 46.9%	5.5%	10.4%
Catalin Corp.	9.4	Down 5.8%	0.1	Up	1.1%	—
Stepan Chemical	8.9	Down 28.7%	0.6	Down 19.1%	6.8%	6.0%
Southern Nitrogen	8.7	Up 22.9%	0.94	Up 40.9%	10.7%	9.4%
Foote Mineral	7.6	Down 21.0%	0.14	Down 67.8%	1.8%	4.4%
Virginia Chemicals & Smelting	5.8	Up 9.9%	0.4	Up 3.4%	6.5%	6.9%
Cowles Chemical	5.3	Up 6.7%	0.2	Down 11.5%	3.4%	4.1%
Michigan Chemical	4.5	Up 16.5%	— 0.15	Down	—	—
Pierce & Stevens Chemical	4.2	Down 6.2%	0.3	Down 8.2%	7.2%	7.4%
Chemway Corp.	3.8	Down 4.2%	0.1	Up 30.1%	2.5%	1.8%
Carwin Co.	1.7	Up 5.6%	— 0.15	Down	—	2.1%
Reheis Co.	1.2	Down 8.5%	0.1	Down 20.4%	7.3%	8.4%

(All dollar figures in millions)

Companies reporting fiscal year results	SALES		EARNINGS		PROFIT/SALES RATIOS Latest	Prior
Dow Chemical	$817.5	Up 0.8%	$64.4	Down 23.6%	7.9%	10.4%
Richardson-Merrell	151.5	Up 14.5%	17.0	Up 18.2%	11.2%	10.9%
International Minerals & Chemical	131.8	Up 4.9%	8.1	Up 6.5%	6.2%	6.1%
American Agricultural Chemical	96.7	—	—	—	—	—
Virginia-Carolina Chemical	83.8	Down 3.5%	2.5	Up 19.9%	3.0%	2.4%
Spencer Chemical	79.1	Up 6.7%	6.9	Down 58.1%	8.7%	9.0%
ATCO Chemical-Industrial	3.7	Down 15.5%	0.1	Up 2.5%	3.3%	6.6%
Companies reporting nine-month results:						
Harvey Aluminum	$ 65.8	Up 54.4%	$ 5.1	Up 37.9%	7.7%	8.6%
Harshaw Chemical	51.3	Down 7.6%	1.3	Up 3.7%	2.6%	2.3%
Air Products and Chemicals	50.8	Up 9.3%	2.6	Up 42.2%	5.1%	4.0%
U. S. Borax & Chemical	49.9	Down 2.5%	4.6	Down 15.2%	9.2%	10.5%
Drackett Co.	23.0	Up 3.2%	2.2	Up 22.7%	9.5%	8.0%

Pharmaceutical Companies	1st half 1961	Change from 1st half '60	1st half 1961	Change from 1st half '60	1st half 1961	1st half '60
American Home Products	$237.8	Up 2.5%	$24.9	Up 2.3%	10.5%	10.5%
Chas. Pfizer	143.0	Up 4.5%	14.5	Up 12.1%	10.1%	9.4%
Sterling Drug	114.4	Up 3.4%	10.8	Up 3.3%	9.4%	9.5%
Merck & Co.	112.8	Up 1.2%	12.4	Down 16.3%	11.0%	13.3%
Eli Lilly	98.8	Up 8.4%	12	Up 10.1%	12.1%	12.0%
Warner-Lambert	98.0	Up 0.7%	7.56	Up 1.2%	7.7%	7.7%
Parke, Davis	90.2	Down 9.0%	9.4	Down 37.7%	10.5%	15.3%
Upjohn Co.	78.6	Up 2.8%	10.1	Down 4.3%	12.8%	13.7%
Smith Kline & French	78.0	Up 6.9%	14.1	Up 16.1%	18.1%	16.6%
Bristol-Myers	75*	—	6.2	Up 16.1%	—	—
Abbott Laboratories	62.7	Up 0.8%	5.0	Down 13.1%	8.1%	9.3%
Miles Laboratories	44.3	Up 13.0%	2.44	Up 41.8%	5.5%	4.4%
Schering Corp.	39.6	Down 7.0%	3.7	Down 7.7%	9.2%	9.3%
Plough, Inc.	25.1	Up 6.8%	1.7	Up 4.6%	6.8%	6.9%
Norwich Pharmacal	22.5	Up 5.9%	2.9	Up 17.4%	13.0%	11.8%
G. D. Searle	21.8	Up 19.5%	4.6	Up 17.7%	21.0%	21.3%
Baxter Laboratories	18.5	Up 5.9%	1.1	Down 14.4%	5.7%	7.1%
Carter Products	15.8	Up 4.6%	2.5	Up 16.5%	16.0%	14.4%
Other CPI Companies						
Eastman Kodak	$414.3	Down 0.7%	$49.5	Down 9.9%	12.0%	13.2%
Aluminum Co.	412.9	Down 6.8%	19.9	Down 8.2%	4.8%	4.9%
National Distillers and Chemical	361.6	Up 0.8%	10.3	Down 23.2%	2.9%	3.7%
Minnesota Mining and Mfg.	290.7	Up 10.5%	34.3	Up 6.0%	11.8%	12.3%
Pittsburgh Plate Glass	283.8	Down 12.4%	13.2	Down 48.9%	4.6%	7.9%
National Lead	247.8	Down 8.2%	22.5	Down 10.9%	9.1%	9.4%
Kaiser Aluminum & Chemical	206.4	Down 3.7%	10.6	Down 9.3%	5.2%	5.5%
FMC (formerly Food Mach. & Chem.)	205.2	Up 13.5%	12.8	Up 5.9%	6.2%	6.7%
Dominion Tar & Chemical	154.4	Up 1.9%	7.2	Down 3.1%	4.7%	4.9%
Koppers Co.	129.0	Down 12.6%	2.76	Down 34.7%	2.1%	2.9%
Rexall Drug and Chemical	118.5	Up 5.5%	4.16	Up 14.3%	3.5%	3.2%
American Viscose	101.1	Down 6.5%	3.3	Down 10.2%	3.3%	3.4%
Thiokol Chemical	85.0	Up 2.0%	2.2	Up 29.1%	2.6%	2.1%
Carborundum Co.	70.1	Down 5.6%	2.7	Down 40.6%	3.8%	6.0%
Rayonier Inc.	64.7	Down 7.1%	3.7	Down 36.3%	5.8%	8.4%
Chemetron Corp.	64.5	Down 5.3%	1.7	Down 31.7%	2.7%	3.7%
Universal Oil Products	52.7	Up 76.3%	1.2	Up 50.5%	2.3%	2.7%
Vulcan Materials	51.7	Down 2.0%	2.0	Up 4.0%	3.9%	3.7%
American Enka	48.1	Up 5.7%	1.8	Up 166.9%	3.8%	1.5%
Texas Gulf Sulphur	29.4	Up 1.0%	6.0	Down 1.4%	20.5%	21.0%
Freeport Sulphur	27*	—	6.7	Up 3.4%	—	—
Hagan Chemicals & Controls	20.0	Down 0.005%	0.8	Down 9.0%	4.1%	4.5%
Columbia Cellulose	16.1	Up 8.3%	0.14	Down 92.1%	0.9%	12.2%
Fansteel Metallurgical	15.8	Down 3.0%	0.7	Down 42.2%	4.6%	7.7%
Molybdenum Corp.	12.4	Up 50.9%	0.36	Up 237.0%	2.9%	1.3%
Pan American Sulphur	9.7	Down 1.4%	1.3	Down 25.4%	13.2%	17.5%
Jefferson Lake Sulphur	5.5*	—	0.3	Up 116.8%		—

* Estimated by CW.

Manganese Data Deal

American Potash & Chemical Corp. (Los Angeles) has added another link with the European chemical industry. The company has signed an agreement to exchange technical information relating to manganese metal with a new French company, Les Meteux Purs Pechiney-Outreau M.P.O.

Pechiney-Outreau, jointly owned by Pechiney and Les Acieries de Paris et D'Outreau, plans to produce electrolytic manganese metal in a new, 3,000-tons/year plant to be built near Boulogne-Sur-Mer, France. APCC is building a 5,000-tons/year plant to produce this metal at Aberdeen, Miss. *(CW, Feb. 11, p. 25).* Heavy rains have delayed construction; onstream target is now early '62.

Other American Potash European activities include a joint venture with Laporte Industries (London) to produce titanium dioxide in southern California *(p. 27);* and Seurobor, a French company APCC organized late last year with Ugine of France to produce boric acid from Turkish ores at Pierre Benite, France.

Scoring the Patent Tiff

General Tire & Rubber Co. has received a Swedish patent on its High-Mooney oil-extended rubber process. This is the process over which it is currently suing U.S. Rubber and Goodyear *(CW, Dec. 24, p. 23)* and over which it is being sued by Firestone.

General Tire hopes the Swedish patent will give it a talking point in U.S. courts. The firm points out that its patent application could have been contested, but nobody objected.

Whether this Swedish approval will be admitted as evidence in U.S. courts, however, is another matter. It will be necessary for the courts to decide whether this is pertinent to the cases involved—and this is difficult under strict U.S. rules of evidence.

Other rubber companies contend that General Tire's patent is not valid, that the technique was perfected under government ownership of the synthetic rubber plants and should therefore be available to all purchasers of these plants. Currently, the technique is being used by virtually all U.S. users of synthetic rubber.

Glidden's Joyce: Two steps away from paints—but all part of plan.

Building on Paint Base

The Glidden Co. (Cleveland) has changed the name of its paint division to Coatings and Resins Division, has bought—for about $10 million—Pemco Corp. (Baltimore), a producer of porcelain enamel, ceramic frits and inorganic colors.

The merger will be voted on by shareholders soon. Proposed terms call for an exchange of 200,000 shares of a new 4¼% convertible preferred Glidden stock for the 100,000 outstanding shares of Pemco common. The new Glidden stock will be convertible at any time into a total of 225,000 shares of common, at a conversion price of about $45/share.

Pemco had '60 sales of $8.4 million, has averaged a bit more than that—$8.6 million—in the past five years. Net profit after taxes last year was $501,000, down from a five-year average of $644,000.

Glidden President Dwight Joyce says Pemco research activities "closely parallel Glidden's inorganic research objectives in refractory oxides, finely divided powders and ceramics." The lab efforts will be combined, he says, with an eye on high-temperature coatings, ceramic-metal combinations, ceramic electronics products.

Under terms of the proposed merger agreement, Richard Turk, board chairman of Pemco, will become a director and vice-president of Glidden. Pemco will be operated as a separate unit of the chemicals group.

Name Change: The name change was made to reflect changes in the industry—changes Glidden feels it has kept up with. "The word 'paint' evokes a rather narrow mental image," says Paul Neidhardt, vice-president. He cites the firm's growth in production of coating materials based on acrylic, vinyl, vinyl alkyd, urethane and silicone resins, and its manufacture of such specialized products as coil and can enamels and urethane foams. The company stresses, however, that it is abandoning paint in name only, intends to intensify its efforts in the field. The division had '60 sales of $89.9 million.

Glidden has been trying the expansion-by-acquisition route often. Early in '61 it bought the metals division of Crane Co., Chicago plumbing and electronics maker *(CW, Feb. 4, p. 25).* Last spring it bought a one-third interest in Hermann Wulfing-Wings Lackfabrik, German paintmaker *(CW, April 1, p. 25).* And this summer, it bought McPhran Corp. (Marietta, Ga.), maker of glass-fiber panels for architectural uses *(CW, June 3, p. 91).*

More Beryl Lined Up

On the heels of optimistic reports concerning domestic beryllium sources *(CW, July 29, p. 17)* comes word this week of progress at two potentially important foreign deposits.

Standard Beryllium Corp. (New York) signed a licensing agreement with Beryllium Resources (Los Angeles) for use of Von Dornick flotation-process equipment at Standard's Boa Vista, Brazil, site, said to contain at least 3 million tons of 2.5% ore.

Standard will erect one processing plant by next January, then start construction of a second, similar unit. Each could process 100,000 tons of ore yearly into 2,500 tons of 12% beryl concentrate for shipment to world markets. Even after both plants are in operation, the company will continue the hand-cobbing operations.

Meanwhile in Canada, Chemalloy Minerals Ltd. (Toronto) is awaiting firm offers before starting mining operations at its Bernic Lake, Manitoba, site. Initial drillings are said to indicate presence of at least 600,000 tons of 2.1% beryl-bearing ore—with prospects of substantially more.

national roundup

Rounding out the week's domestic news.

Companies

Standard Oil Co. of California (San Francisco) stockholders will vote at a special meeting Sept. 7 on the proposed merger with Standard Oil Co. of Kentucky (Louisville), whose shareholders will take similar action the same day. The Kentucky company cited worldwide surpluses of crude oil, price wars and inflation as factors that have made it unprofitable for the company to continue solely as a marketer of conventional petroleum products.

Thiokol Chemical Corp. (Trenton, N.J.) has established a regional office in Cocoa Beach, Fla. The new operation will coordinate the company's rocket activities in the Florida area under the jurisdiction of Thiokol's district office in Huntsville, Ala.

American Cyanamid Co. (New York) has transferred operation of its subsidiary, Celastic Corp. (Kearny, N.J.), from the firm's Wasco Products Dept. to its Commercial Development Division. The move follows Cyanamid studies showing marketing possibilities for Celastic products in the shoe industry.

Fluor-Singmaster & Breyer Inc. (New York) has adopted that name to reflect more accurately its relationship with Fluor Corp. Ltd. (Los Angeles). S&B became Fluor's New York engineering subsidiary in '54.

Henolite Products Inc. (Phoenixville, Pa.) has been formed and will start production of molded polystyrene foam products at its 8,000-sq.ft. plant early this fall.

Expansion

Titanium Dioxide: American Potash & Chemical (Los Angeles) has taken an option on a site at Mojave, Calif., in the Mojave desert, as a possible location for the titanium dioxide plant it plans to build as a joint venture with LaPorte Titanium Ltd. of London *(CW Business Newsletter, Nov. 26, '60)*. Several other southern California sites for the $15-million, 25,000-tons/-year venture are also being weighed.

Acetal Resin: Du Pont (Wilmington, Del.) will build a plant in Tulsa, Okla., to manufacture oilfield pipe from Delrin acetal resin. The 5-million-lbs./year facilities are due onstream by mid-62. Construction follows three years of field-testing the new pipe in the Southwest and other oil-producing regions.

Glass, Lime: International Glass Industries Ltd. (Vancouver, B.C.) will start construction of a $1.5-million, 40-tons/day window glass plant in Tacoma, Wash., early next year. Gypsum, Lime & Alabastrine Ltd. (Toronto) will supply lime from a $2-million plant it will build nearby.

Pulp & Paper: Brunswick Pulp & Paper Co. (Brunswick, Ga.) has awarded to Stone & Webster Engineering (Boston) the major contract in a $35-million expansion program aimed at bringing the plant's pulp capacity up to 1,120 tons/day. Completion target: Jan. '63.

Fluorocarbons: W. L. Gore (Newark, Del.) has doubled its capacity for producing Teflon-insulated wire and cable.

Soda Ash: Stauffer Chemical (New York) has begun development of underground work facilities at its soda ash project near Green River, Wyo. *(CW, Oct. 29, '60, p. 26)*. Removal of trona ore is scheduled to begin in mid-September.

foreign roundup

Rounding out the week's international news.

Antibiotics, Veterinary Drugs/Formosa: Pfizer International, subsidiary of Chas. Pfizer & Co. (New York), will construct a 16,000-sq.ft. plant near Taipei to supply a wide range of veterinary and animal health products, antibiotics, steroids, pharmaceutical specialties. Operation is expected to start next May.

Calcined Coke/India: The Indian government has approved plans for a new company, India Carbon Ltd., to construct a 60,000-tons/year plant to produce calcined petroleum coke and calcined anthracite coal. Onstream date: Sept. '62. Great Lakes Carbon Corp. (Los Angeles) will be technical collaborator and is expected to take up to 40% of the stock in the new company.

Detergents/Honduras: Quimicas Dinant, locally owned company in Tegucigalpa, Honduras, has received a $360,000 loan from the Inter-American Development Bank to build a detergents plant. Mario Balestra & Co. (Milan, Italy) will install equipment and supply know-how on its patented process. The new plant is expected onstream in one year. Market: most of the countries in the Central American Common Market.

Metallic Stearates/Holland: Gouda-Apollo (Gouda) has formed a subsidiary, Witco-Gouda Stearaten N.V., to manufacture metallic stearates under the license of Witco Chemical (New York).

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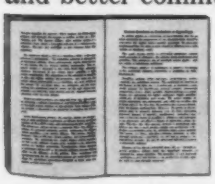

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Washington
Newsletter

CHEMICAL WEEK
August 19, 1961

A slight easing of rules for labeling of hazardous items is announced by the Food and Drug Administration. FDA officials feel that they have met all the "reasonable" objections of industry in final regulations for the federal hazardous substances labeling law, but they still expect some protests. Industry contended that the original proposals were unreasonable and would result in so much cautionary labeling that the public would soon ignore the warnings (CW, July 22, p. 25).

Final regulations, just published, retreat on some key features criticized by industry, but hold fast on others. Labels still must be on the main panel calling attention to the danger, but type size requirements have been cut, and details about antidotes and other data may be printed elsewhere. Specific tests are spelled out, against the advice of some industry spokesmen. But the way has been left open for specific exemptions in cases where the form in which the substance is sold, and human experience, indicate that it shouldn't really be classed as hazardous.

The new law has already gone into effect on extremely flammable and highly toxic substances. The controversy has entered on areas left to FDA to define, involving toxic, corrosive, irritating and strongly sensitizing substances. In addition to considering exemptions, FDA will rule on proposed labeling as quickly as it can. The effective date, Feb. 1, '62, will be met, although temporary stick-on labels and tags may be used in the beginning.

Four of six substances classed as "highly toxic" in the original proposed regulations were relisted as "toxic" in the final rules, and specific labeling requirements were listed.

•

Defense contractors must pay for advertising out of profits in the future, rather than consider it part of the cost of doing business with the government. This prohibition—which applies to chemical companies and their federal contracts—is contained in the new military appropriations bill approved by Congress. The pertinent clause: "No part of the funds appropriated herein shall be available for paying the costs of advertising by any defense contractor, except advertising for which payment is made from profits, and such advertising shall not be considered a part of any defense contract costs." Other exceptions include advertising for recruitment of personnel, procurement of scarce items and disposal of surplus materials in performance of a defense contract.

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Price, sales and promotion practices of the drug industry are under study by the Federal Trade Commission. Basically, FTC is trying to determine if drugmakers are granting illegal price discounts to large drug chains and if they use deceptive advertising and promotion material.

FTC has asked 37 major drug manufacturers for copies of their ads and labels, plus detailed information about prices, classes of

customers and other similar data. Replies are due within 45 days, with companies subject to fine for noncompliance. Granting lower prices to favored customers is banned by the Robinson-Patman act. FTC says it has received complaints that some drug producers have "exaggerated the therapeutic benefits of their prescription drugs and have failed to reveal side effects."

•

Electric generators for the Hanford nuclear reactor are out—unless the Senate decides to get as tough as the House. In that case, the whole atomic energy construction program for fiscal '62 may be left up in the air. The situation is rapidly taking on all the aspects of a stalemate.

The situation is this: The Senate approved $95 million for Hanford generators. The House eliminated the item. Before sending the question to conference, the House voted overwhelmingly to instruct its conferees to stand firm. There is a possibility now that if the Senate conferees refuse to budge, a completely new AEC construction bill will have to be introduced.

•

Renewed hope for President Kennedy's saline water program comes from Sen. Clinton P. Anderson (D., N.M.), chairman of the Senate Interior Committee. He has scheduled hearings for Aug. 22 with the blunt words: "We want to open the way for local governments and private industry to take a greater part in the program."

The House Interior Committee dampened hopes for Kennedy's ambitious plans by authorizing a $50-million/year program for research and development. The House group dropped Kennedy's plans for more federal demonstration plants and loans and grants to water-short communities.

Meanwhile, the new Freeport, Tex., saline water plant has developed minor troubles and has been shut down for repairs. About 1,700 carbon steel lugs in the plant's heat exchanger system have corroded and are being replaced. Allen Cywin, chief of the Office of Saline Water's engineering section, described the difficulty as "minor."

•

Development of chemically fueled rockets will receive about 25% of the $1.7 billion Congress allocated to NASA for the current fiscal year. Fringe work may push the percentage ever higher, as may a supplemental appropriation request the Administration is expected to send to Capitol Hill early next year.

In the new space budget, $224.2 million goes for development of the liquid-fueled Saturn booster; $56.4 million for Centaur; $48.5-million for the Nova booster that will land a man on the moon (liquid and solid propulsion are competing for this program); $3.7 million for the solid-fueled Scout, and $2.9 million for Delta. In addition, the Air Force will spend some $100 million in fiscal '62 for solid fuel development.

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The Arithmetic of Materials Handling

Fuller Airveyor unloads wood flour to two forty-five foot silos. Second Airveyor system reclaims material 360 feet to processing.

General Electric Changes From Bags to Airveyor ... Cuts Handling Costs 60%

As part of a program to increase plastics production and reduce operating costs at its Pittsfield, Mass. plant, General Electric Company called in Fuller engineers to design systems for handling wood flour in bulk.

Wood flour—used as a filler in phenolic molding compounds—was being handled in 75 and 100-pound bags. Unloading one carload of bags required 16 manhours. Bags were loaded on dollies and wheeled to a distant elevator.

SAFETY FIRST—The two pneumatic Airveyor® materials handling systems, engineered and manufactured by Fuller Company, were installed by its parent company, General American Transportation Corp., providing undivided responsibility. This installation resulted in a 60% saving in handling costs! The two systems are handled by one full-time and one part-time operator. Manhours to unload one car have been reduced from sixteen to six!

In addition, all equipment is designed to conform to strict safety specifications set down by G-E engineers.

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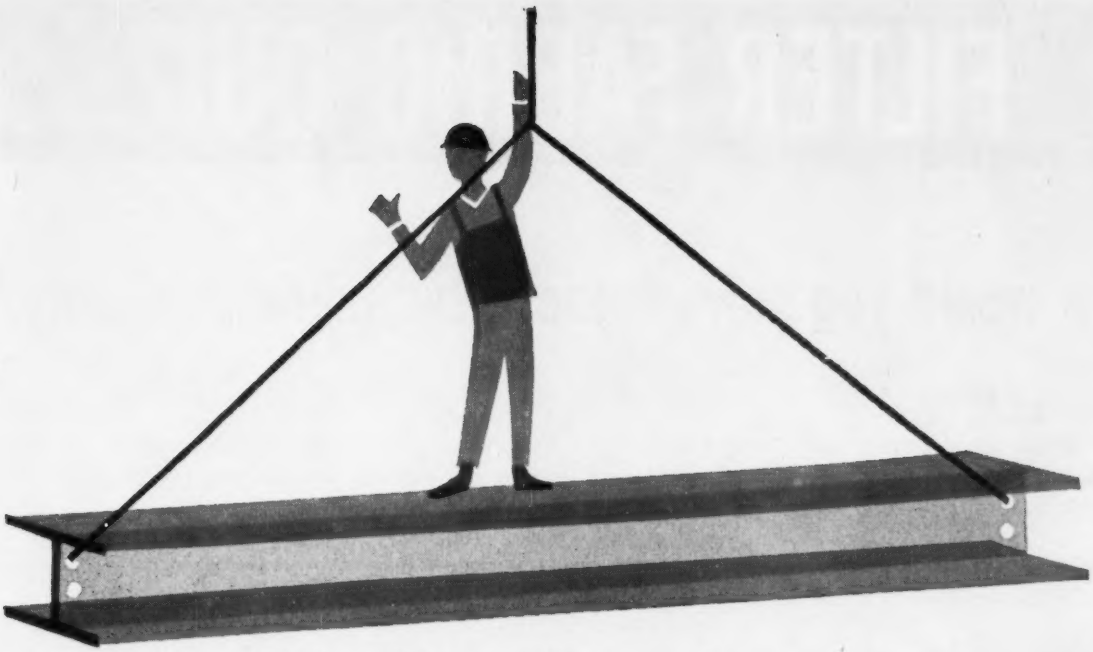
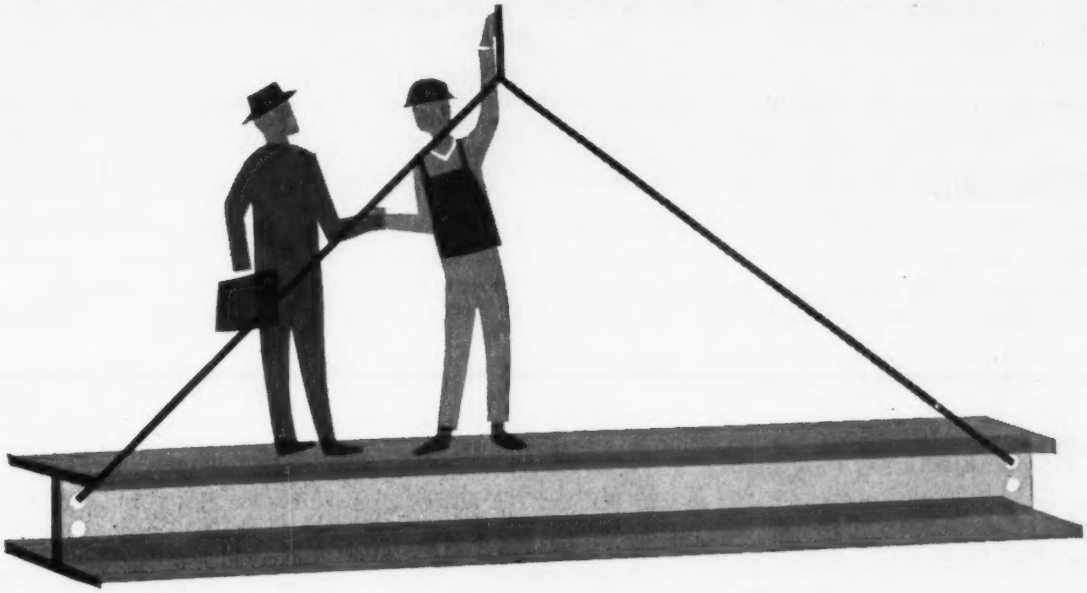


If "growth" is a big word around your company...



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FILTER FABRIC QUIZ

How would you solve these filter fabric problems?

PROBLEM:

You're a soap manufacturer. You wish to filter foreign matter from oil and glycerin. What filter fabric would you use?

SOLUTION:

Closely woven cotton duck has withstood six months of this arduous service. For even longer life, nylon fabrics are recommended.

PROBLEM:

You're a dyestuffs manufacturer. You wish to separate a dye intermediate from a sulphuric and hydrochloric acid solution at 45°C. What filter fabric would you use?

SOLUTION:

A spun dynel fabric with high chemical resistance is both dependable and durable for this highly corrosive process.

PROBLEM:

You're a ceramics manufacturer. You wish to filter clay slurries. And the filter fabric must have good release characteristics and resist mildew and bacteria growth. What filter fabric would you use?

SOLUTION:

A tough fabric of filament nylon is sleek enough that the filter cake drops away at the touch of a scraper—and so durable that fabric life is multiplied many times.

PROBLEM:

You're a pigment processor. You wish to filter titanium dioxide from strong acid solutions with vacuum-type filters. What filter fabric would you use?

SOLUTION:

A fabric of filament Dacron*, highly resistant to mineral acids, provides smooth cake discharge and long service for maximum operating economy.

Each of these solutions is but one of many ways to solve these problems. For, as you know, countless factors help determine a filter fabric's performance—fiber, yarn, weave, count and finish, to name just a few. Selecting the most effective and economical filter fabric for a particular job is a very complex matter. And you need the assistance of a specialist—like the specialists who distribute Wellington Sears fabrics. These distributors are experts in the field of industrial fabrics—and always ready to lend a hand in helping solve your problems. For their names, and a free copy of our illustrated booklet, "Filter Fabric Facts," write Dept. M-8 today.

*DuPont trademark for its polyester fiber

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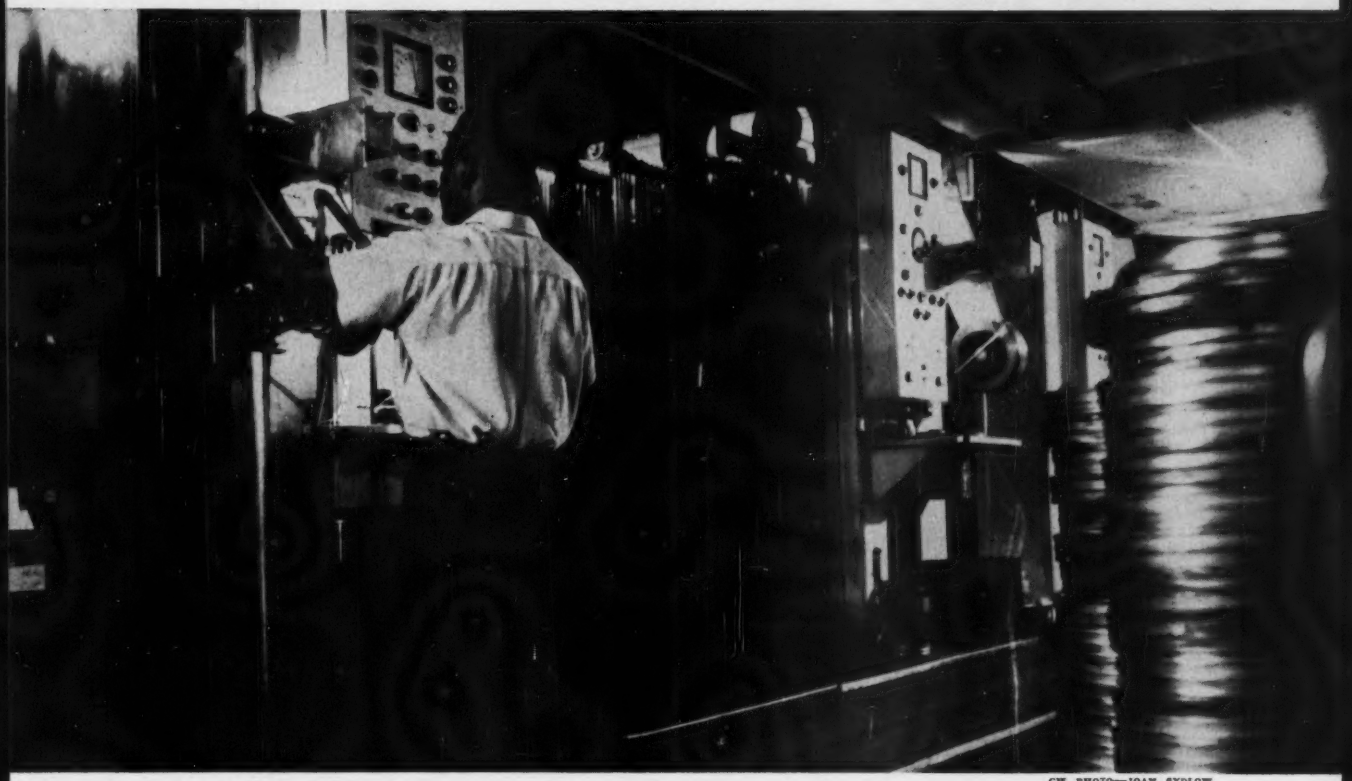

CW PHOTO—JOAN SYDLOW

Highly automated units develop new Technichrome 8-mm. film at Technicolor's New York laboratory.

Technicolor Woos Amateur 'Shutter Bugs'

Recent entry of Technicolor, Inc. (Culver City, Calif.), into the marketing of 8-mm. color film, along with its plans to market a low-cost (under $100) 8-mm. movie projector, mark first steps by the company to compete across-the-board with long-entrenched Eastman Kodak in the $2.5-billion/year U.S. photographic market.

Currently, Technicolor's efforts are concentrated on marketing an 8-mm. color film, made for it by Ansco Division of General Aniline & Film. The new film, called Technichrome, sells for about $4.70 ($2.85 for the 50-ft. film; $1.85 for processing). It's being sold in selected East and West Coast cities, and national distribution is expected within a year.

The hookup between Ansco and Technicolor took place after talks between Du Pont and Technicolor fell through. Since then, Du Pont and Bell & Howell (Chicago) (top U.S. seller of U.S.-made 8-mm. cameras and movie projectors) have made arrangements to bring out a Du Pont-made, Bell & Howell-distributed, 8-mm. film within the next year or so.

There's no mystery about why these outfits are showing interest in the consumer market for photographic products. Photography is now one of the top hobbies in the U.S. There are over 50 million camera owners in the U.S. And one of biggest trends in the industry is toward low-cost movie cameras, especially the 8-mm. type, which are now owned by about 4.5-5 million "shutter bugs" in the U.S.

Complete national distribution of the 8-mm. film by Technicolor could mean that the company has plans to further increase the number of its processing plants throughout the country, either by outright purchase or, which seems more likely, through some sort of licensing arrangement. Exposed film is now sent to Technicolor's Los Angeles or New York plants for processing, depending on customer proximity. Processed film is returned to the customer within 24 hours of receipt at the plant. To maintain this kind of service, Technicolor presumably would have to set up processing operations at widely scattered points throughout the country.

More Coming: Although only one product is being sold under the Technicolor name—i.e., the 8-mm. outdoor motion picture film—Technicolor says it intends to have an indoor type available within the next month. (This could be somewhat longer in coming, since in the past the company's reach has somewhat exceeded its grasp. The new projector, for instance, was originally scheduled for April marketing, is only now appearing on retailers' shelves.)

Before the end of the year Technicolor will also market a negative still film (the kind used for making prints) in

Closeup of Technicolor's new 8-mm. film running through processing unit.

the popular 120, 620 and 127 sizes.

Among its talking-stage projects are plans to market a 35-mm. negative film (the kind used in Leica-type cameras), a sound projector, an 8-mm. magazine load, and a 16-mm. film. With all these products the consumer would be required to purchase Technicolor's processing.

Who's on Film: Whether Ansco will manufacture the film for these ventures is conjectural. There has been some talk in the trade that Technicolor has been dickering with some foreign film companies. One company mentioned as a future possible supplier of color negative film is Italy's top film-making outfit, Ferrania. Another is Japan's Fuji Photo Film Co.

Not all the talk has been about film. It's well known that Technicolor has been planning a complete line of simplified movie cameras, geared like a projector, that would be aimed at the large-volume amateur market. Having its own camera would provide Technicolor with a camera-film line, a combination now offered by such companies as Eastman Kodak, Agfa (the world's second-biggest film maker), Ansco, and the new Bell & Howell-Du Pont combine. Not in film yet, but a possibility for the future, is Minnesota Mining and Manufacturing Co., which already has Revere Camera in its corporate fold.

Strong Merchandiser: Although Technicolor is a late starter in the consumer field it has a number of factors working for it. First there's the widespread consumer acquaintance with the name, cultivated among moviegoers, to whom the name Technicolor was once practically synonymous with color films.

Another factor helping Technicolor in the consumer market is the tieup with Eversharp, Inc., the razor and blade maker. That company entered into a contract in Sept. '60 with Technicolor by which it became the management consultant to Technicolor. (Patrick Frawley, besides being top corporate officer of Technicolor, is also top man at Eversharp.) With the Eversharp group, Technicolor is aligned with a company that has a good distribution setup and long experience in selling, in the consumer market.

Also aiding Technicolor in the consumer line was the purchase (in March of this year) of Marshall-Burns and affiliated companies, a $9-million/year nationwide distributor of specialty products to the drugstore and supermarket chains.

Big Plans: In a speech before security analysts a few months ago, Chairman Frawley (who took over that post in February) gave some indication of other interests of the company. Development of the new cartridge-type projector, he said, might open new markets for educational, sports and institutional films. He figures that these films (which Technicolor would market) could be mass merchandised in the same way as paperback books. Also mentioned as a possibility for the future: reading heads and other sensing controls for automated machine tools, and a catalog of children's cartoon films.

Some idea of Technicolor's over-all aims is indicated in recent remarks by Chairman Frawley. "This industry," he said, "is obstructed on all sides by technical details . . . so complex that the public is confused. We plan to simplify the photographic equipment field so that Americans will use their cameras not 10 times a year but 90 times or more."

Terpolymer Polish

Simoniz Co. (Chicago) has revealed a few more facts about the acid-soluble floor polish it will introduce this month (*CW, July 22, p. 79*). Key to the formulation is a new terpolymer that combines a new monomer (undisclosed) with two old stand-bys of the polish field, styrene and acrylic monomers.

The first product, to be introduced this month, is an industrial polish called Permacrylic that will sell for about $3/gal.

A household version of Simoniz's detergent-resistant product will follow shortly, probably will carry the tradename "Lock and Key." So far, a price has not been set for the consumer item.

In addition to Simoniz's product, another detergent-resistant product has recently been introduced. Fuld Brothers (Baltimore) has brought out Glo-Zip, which the company describes as a water-emulsion acrylic polymer-based product. Fuld will market the product to private-label distributors in 1-, 5-, 30- and 55-gal. drums, sell the remover in similar-packaged sizes. Another company said to be developing a similar polish is U.S. Sanitary Specialties Corp. (Chicago).

Another recent development of interest in the polish field is the report by T. F. Washburn (Chicago), a division of Purex Corp., that it is now manufacturing a line of emulsion polymers for floor finishes under the tradename Polymax. The new line contains copolymers and terpolymers, particularly those of styrene and acrylics.

Paper Premier

Hilton-Davis Chemical Co., a division of Sterling Drug, has entered the paper brightener field with a new optical brightener.

Tradenamed Hiltamine Arctic Paper White, it's supplied as a clear, odorless, neutral solution containing no flammable solvents. Because it's predissolved, the new agent is said to eliminate the specking and unevenness of finish often encountered with brightener powders.

The brightener is stable in acid or alkali with 2-12 pH and is compatible with most paper additives, including starch and rosin sizes.

The right-hand glass panel which the chemist is holding is coated with a varnish based upon dehydrated castor oil and coumarone-indene resin. Incompatibility of the ingredients has made the film cloudy. The panel on the left was coated with the same varnish except that 5% of the resin was replaced with Nevillac. The mixture is now compatible and perfectly clear.

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One important feature of Nevillac, Neville Chemical Company's family of hydroxy resins, is its value as a co-compatibilizing agent in the formulation of coatings. It is inherently so highly compatible and soluble that it acts as an effective agent in bringing normally unfriendly materials together into clear film. This characteristic generally pertains to its use with most elastomers, plasticizers, solvents and other resins.

There are, however, several other good reasons for considering Nevillac as a valuable addition to coatings. Nevillac possesses strong ability to increase adhesion, control viscosity, and add resistance to water, acids and alkali. It also possesses permanent thermoplasticity and ease of emulsification. If you formulate coatings, it may well pay you to write for Neville's Technical Service Bulletin No. 75, and then a laboratory sample of the Nevillac grade potentially most useful to you.

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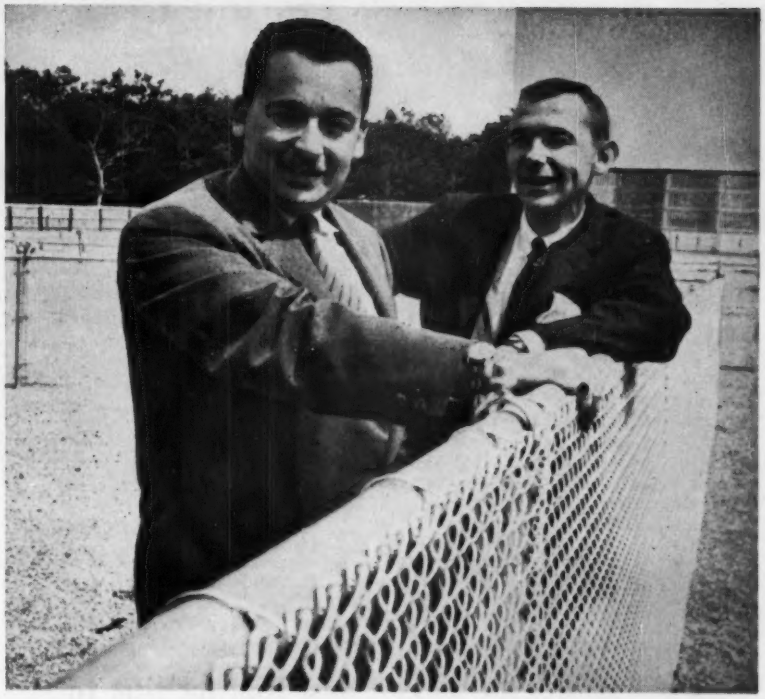

Colorguard's Rose and Solloway: Leaning on new vinyl market.

Vinyls on the Fence

A bright new U.S. market for polyvinyl chloride is about to be tapped. A plant in New Jersey will soon manufacture vinyl-coated chain-link fencing.

Colorguard Corp. (New York), a new entry in the fencing industry, has installed machinery at Harborside Terminal, Jersey City, capable of turning out 1 million ft. of vinyl-covered wire daily in green, blue, salmon, white and black. Coating of the wire, achieved by extrusion, is about 20 mils thick.

The vinyl, which is supplied to Colorguard by Union Carbide, has a tensile strength of 3,300 psi., can be stretched 290% of its original length without failure, and pressure of 1,855 lbs. is required to cut through it. Besides being resistant to heat and cold (it has been tested at —60 to 248 F without failure) the vinyl-clad galvanized steel wire fence is said to be resistant to mould and fungus.

Chain-link fencing is a substantial market in the U.S. The industry consumes about 500,000 tons of steel annually, and sales for all purposes are said to be about $250 million/year. Annual usage for U.S. homes—one of the prime targets for vinyl-clad fencing—is over 37.5 million ft.

About 15% of chain-link fencing now used is colored; most of it is supplied by foreign sources. Introduction of the Colorguard product the first U.S.-produced vinyl-clad fencing, is expected to stimulate more interest in the colored product. Edmund Rose, president of Colorguard, says that wholesale price of the material will be "competitive with steel fencing and as much as 50% less than that of aluminum fencing."

Use of vinyl for outdoor structures has already been proved successful in applications ranging from sprayed-in-place coating at the Guggenheim Museum in New York City to TV antennas on top of the Empire State Building. Other structures using vinyls include buildings at the Los Angeles Airport and the Blythe Arena at Squaw Valley. In the photo above, Rose and William Solloway, vice-president of sales, are leaning on a blue and white vinyl-covered fence, which is being installed at a drive-in theatre on Long Island, New York.

PROGRESS REPORT

—FLEXOL Plasticizer 13-13
—NIAX Triol LM-52
—Improved Acrylates

Primary plasticizer improves insulation and auto vinyls

FLEXOL Plasticizer 13-13 (di-tridecyl phthalate) is a new primary plasticizer for vinyl chloride resins and copolymers. This plasticizer is particularly useful in formulations for vinyl automotive upholstery where low soapy water extraction and anti-fogging properties are critically important.

FLEXOL 13-13 has excellent viscosity stabilizing action in plastisol systems. Initial viscosity is higher than that obtained with other phthalate esters, due to the inherent higher viscosity of the ester. Its combination of good electrical properties, very low volatility, good heat stability, and low moisture extraction make this new material ideal for applications requiring effective oil and water resistance—high-temperature wire insulation, gasketing, and jacketing compounds.

Also, CARBIDE has developed FLEXOL Plasticizer 13-13X (containing 0.25 weight per cent bisphenol A) as a low-cost, superior plasticizer for high-temperature vinyl insulation compounds. FLEXOL Plasticizers 13-13 and 13-13X are available in any quantity, up to tank car lots.

Physical Properties of FLEXOL 13-13

Molecular Weight	530
Specific Gravity, 25/25°C.	0.950
Boiling Point, °C. at 3.5 mm. Hg	285
Pour Point, °F.	–35
Flash Point, °F.	450
Viscosity, cps. at 25°C.	190
Refractive Index, at 25°C.	1.4835

You can obtain complete information on the interesting properties of both FLEXOL 13-13 and 13-13X through your nearest CARBIDE Technical Representative, or by using the coupon below.

New triol for firm to super-soft foams

The basic need of the flexible polyether foam industry for a diversified intermediate has been met with NIAX Triol LM-52. Using this material and varying the formulation slightly, it is possible to produce flexible polyether foams for a wide range of end-uses.

One of the more important advantages of NIAX Triol LM-52 is its usefulness in producing foams with varying physical properties. In addition, NIAX Triol LM-52 can tolerate a wide range of tin catalyst concentrations with little or no sacrifice of properties—a factor of major importance in the processing of flexible polyether foams.

Using NIAX Triol LM-52 as the sole intermediate, foams can be made having one-inch RMA's of 8 to 33 pounds per 50 square inches, and four-inch RMA's of 14 to 50 pounds per 50 square inches. This variety of load-bearing properties was obtained by changing only the amount of silicone oil and water used, and adding different amounts of UCON Propellant 11.

Firm, medium, soft, and super-soft foams for various furniture applications can be obtained by using NIAX Triol LM-52. Changes in automotive specifications should require only minor additions or reductions of other materials used in the formulation.

Your CARBIDE Technical Representative will provide complete information, or you may use the coupon below.

Lower inhibitor levels in improved acrylates

CARBIDE's continuing policy of improving the quality of acrylates has resulted in the development of new grades of ethyl, butyl, and 2-ethylhexyl acrylates—all with lower concentrations of hydroquinone (HQ) or the monomethyl ether of hydroquinone (MMHQ).

Lower inhibitor levels offer several distinct advantages during production of latexes. Formulators need less catalyst to overcome the inhibitor, polymerizations start faster, and the possibility of color development from the catalyst-inhibitor reaction is greatly reduced.

The following table summarizes inhibitor levels for acrylic acid and its esters. The new grades are indicated by asterisks (*):

	HQ ppm	MMHQ ppm
Ethyl acrylate	200*	200
Butyl acrylate	60*	60*
2-Ethylhexyl acrylate	100	100 60*
Acrylic acid, glacial	—	500
Acrylic acid, aqueous	—	500

Extensive tests indicate that these new, low-inhibitor grades can be shipped and stored in the same way as higher-concentration grades.

Full information on these improved materials is obtainable through your CARBIDE Technical Representative.

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Foamed-over sewage plant illustrates disposal problem caused by ABS compound in waste water.

New Challenge in Water Cleanup

A novel fatty alcohols plant in the U.S.; a three-year product test in Britain; a proposed law in Germany. Three isolated news items, but they're all tied into the growing international concern for removal of synthetic detergents from sewage.

In the U.S. alone, at least five groups have a vital interest in syndets that can be removed readily:
(1) producers of dodecylbenzene—now enjoying a $50-million business—and makers of other detergent raw materials; (2) detergent makers that sulfonate the dodecylbenzene, yielding alkylbenzene sulfonate (ABS), the key component in most syndets; (3) pollution authorities (e.g., the U.S. Public Health Service); (4) the cost-conscious consumers; and (5) municipal sewage and water treatment plant managers and city officials.

To all five, the crux is ABS. It makes up about one-quarter of most syndet formulations. (In the U.S. last year, syndets were an $800-million business.) And ABS's research-spurring characteristic is that it is resistant to removal (breakdown) by conventional sewage treatment. It does break down slowly; but according to Richard Woodward of the Robert A. Taft Sanitation Engineering Center (Cincinnati), "bacteria and ABS are virtually indifferent to each other."

More readily treated detergents are available—but they would cost the consumer more. Better sewage treatment plants are in the offing. But building and operating plants to effectively process the currently used materials would be costly.

Better performance at no cost increase—in both the syndets and sewage treatment—is thus the goal of most research. Latest developments:

- Producers of both raw materials and finished syndet formulations are searching for new detergent components that will readily break down in sewage treatment. Continental Oil Co. (Houston, Tex.) figures that Ziegler-type fatty alcohols will do the job and the firm will assign to syndets part of the output of the 50-million-lbs./year alcohols plant it is now building. Shell Chemical International Co. Ltd. (London) is running a pilot study of sewage plant acceptance of syndets made with less-branched ABS, derived from cracked olefins. Oronite Chemical Co. (San Francisco) is studying a somewhat similar cracked wax olefin detergent in this country. And Stepan Chemical Co. (Northfield, Ill.) is developing a tallow-derived detergent. Either product is more biologically degradable than is conventional ABS.

- Attacking the ABS problem directly, Chemical Process Co. (Redwood City, Calif.), Pfaudler Permutit Inc. (New York) and Radiation Applications, Inc. (Long Island City, N.Y.), are working on new water-cleanup systems.

- There is greater public concern with the subject. Federal grants for sewage disposal plants (*CW, July 22, p. 36*) have been increased; Surgeon General Luther L. Terry has revised "recommended drinking water standards" on interstate vehicles (*CW, July 29, p. 20*).

Abroad, West Germany appears to strongly favor a law restricting the use of nonbiologically degradable detergents. (In Germany, water is "reused"—e.g., by the next city down the river—to a considerable extent more than in the U.S. But even in the U.S., five or six "uses" aren't uncommon.)

All this concerns itself with ABS—a compound that no one has any reason to feel is toxic. P. John Weaver, of Procter & Gamble, says the

Technical Advisory Council of the Assn. of American Soap & Glycerine Producers (New York) has looked for some indication of its hazard for some time, via studies at the Hazleton Laboratories (Falls Church, Va.). So far, he says, tests prove that ABS is nontoxic in rats; larger animals are now being tested.

But cloudy water can be unappealing—and when the ABS concentration is considerable it can affect the operation of sewage treatment stations.

New Formulations: Concerning research for new products, industry is far more willing to talk about new raw materials than it is about specific formulations—for obvious competitive reasons.

Continental Oil's 50-million-lbs./-year plant in Lake Charles, La., for example, will make dodecyl alcohol, which can be sulfated to an effective biodegradable detergent. (It will be one of several straight-chain fatty alcohols made by Ziegler-type ethylene polymerization.)

At least one detergent producer feels that the alcohol would be more costly and not as good a cleanser as ABS. But Continental seems so confident about its raw materials' prospects that it has lined up a German firm, Deutsche Erdoel AG., to build a plant at Brunseittelkoog, near Hamburg, Germany. Construction of that plant, however, hinges on passage of a proposed law barring use of conventional ABS. The proposed unit would be twice the size of that at Lake Charles and would produce similar products. And still another plant for these straight-chain compounds may be built by Phillips Petroleum, also familiar with Ziegler polymerizations.

Cutting Branches: Another attempt to replace ABS is under way by Shell Chemical International, which has a biodegradable detergent alkylate called Dobane JN, now completing its third year of "test run."

A cracked wax olefin, it is a less-branched, "soft" type of ABS. Consumer products made with it are being tried at Luton, England, where, because of a low water supply, there have been problems with ABS-caused clouding.

Preliminary results of the test appear in a fourth analysis report by the Ministry of Housing and Local Government's Standing Technical Committee on Synthetic Detergents. It states that a substantial foam decrease has been achieved—the new syndets can be biodegraded about one-third more than can conventional ABS products—not as much as was hoped. However, the evaluation suffered because of the difficulty of keeping out detergents other than those based on Dobane JN.

Another Biodegradable: Stepan Chemical Co. has had a tallow-based detergent, now labeled 201-27P, in pilot-plant production for two years. E. J. Black, vice-president and general manager of Stepan's Industrial Chemicals Division, identifies the material only as "tallow-based and hence containing both saturated and unsaturated components."

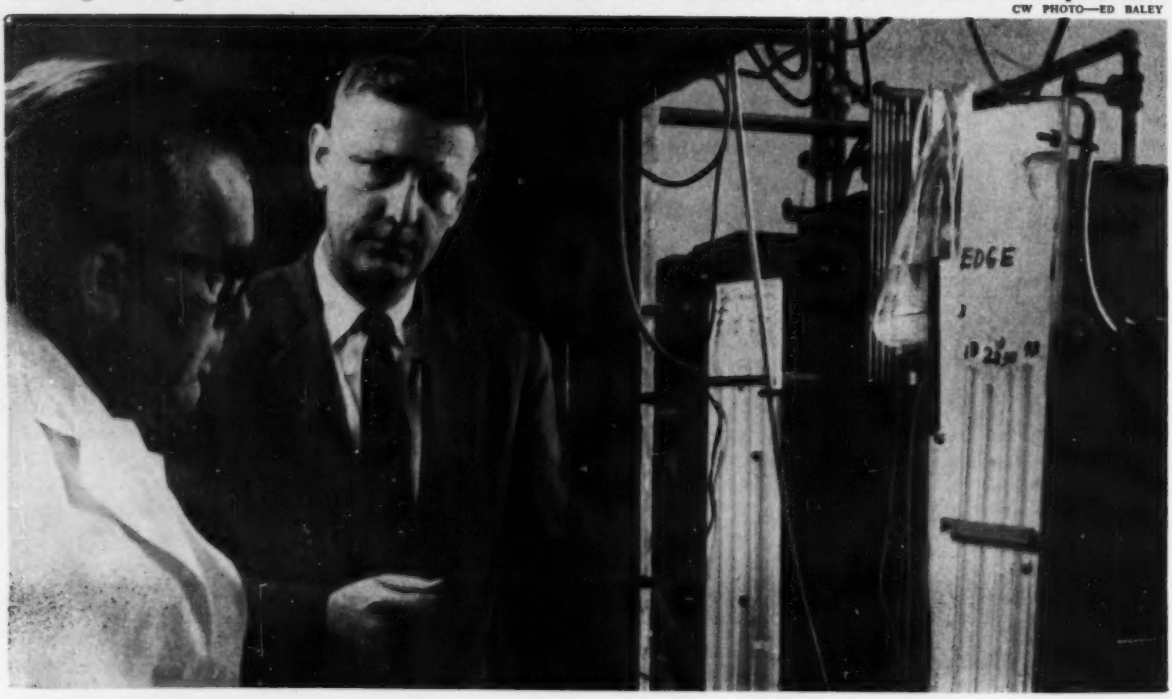
Tallow, of course, is animal fat which yields oleic and stearic acids. Detergents are now made with other, inexpensive animal fats as secondary components.

Most other new compounds touted for their biodegradability are petroleum-based. In the U.S., however, petroleum-derived ABS substitutes may be too costly, although dodecylbenzene is now made from propylene.

Stepan predicts that on a large-scale basis, its new product could sell for 15-20¢/lb. This is about 50% more expensive than ABS. But Oronite Chemical, a big supplier of dodecylbenzene, might soon be able to offer a straight-chain variety of ABS—also

Taft Engineering Center's Robert Woodward (l.), AASGP's P. John Weaver seek solution of ABS problem.

CW PHOTO—ED BALEY



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In fact, Oronite's parent company, California Chemical, reportedly is thinking of a 100-million-lbs./year plant for cracked olefins. The straight-chain detergents can be made by the Ziegler building-block approach (endorsed by Continental and Phillips) or by conventional thermal or catalytic cracking (endorsed by Shell and California). If the price of these olefins can be dropped low enough, they could be used to make substitutes for dodecylbenzene (now 11¢/lb.). Then other firms—e.g., Humble Oil & Refining (Houston) and Atlantic Refining Co. (Philadelphia)—might get into the competition.

Physical Removal: Some ABS can be disposed of at sewage treatment plants by fairly sophisticated operation. This sort of plant improvement will probably be the main point of soon-to-come action in the U.S. Reason: the problem exists in only a few sectors of the country. Major cities are now removing ABS without much difficulty. But there are special problems—e.g., coin-operated laundries at suburban shopping centers can overload local disposal plants with excess ABS.

To aid the ordinary sewage plant, Chemical Process Co. has developed an ion-exchange system that can remove 99% of the ABS from waste water. A strongly basic anion exchanger, called Duolite A-102D, is used. After adsorption on the chloride-containing resin, the ABS is washed out of it with a mixture of mineral acid and a polar solvent.

Chemical Process has completed the laboratory work, and now equipment manufacturers are developing commercial systems. Illinois Water Treatment Co. (Rockford, Ill.), Cochrane Corp. (Philadelphia) and Graver Water Conditioning Co. (New York) are among the equipment makers working with CP resins. Cost is still the big hurdle. Without regeneration, based on water with 2 ppm. ABS, the resin cost would be 5.4¢/1,000 gal. of water treated.

If high throughputs were practical —and this will depend on the location of specific plants—methanol or acetone and acid could be used to regenerate the resin. Such regeneration cost is estimated at 0.5¢/1,000 gal. water treated.

Chemical Process visualizes applications of its development in any sewage disposal plant where ABS is a problem. But to remove high concentrations of the compound, other equipment is needed. The anion-exchange method is not intended to operate when ABS content is above 10 ppm.

Taking Out Gobs: Concentrations upward of 30 ppm. ABS are found in laundry effluent. Although this is considered the most critical area in the detergent cleanup problem, there is hardly a system on the market that effectively handles it.

Currently, however, Pfaudler Permutit is getting set to test out a new water treatment system that reportedly meets 30-ppm. conditions, and higher. The pilot run will be somewhere in Long Island, starting early next year. Since the system is still being perfected no details have been disclosed. But it will be a compact package unit that will operate on each laundry company's effluent individually.

Permutit has also recently developed a new defoamer (foaming is one of the major problems caused by ABS—it causes flooding of sewage equipment). At its Ionac Chemical Division (Birmingham, N.J.), the new chemical (formula is undisclosed) is reported to be 3-10 times more effective in removing foam in water treatment plants than are other defoamers. Net cost per dose is less than that of competing chemicals, although the price per pound (25-40¢) is higher.

Foam Fractionation: Radiation Applications, Inc., is also working on sewage cleanup techniques. It recently received a $30,000 contract from the U.S. Public Health Service to study foam fractionation as a technique for removing sewage treatment contaminants. In a batch foam column, ABS content has been reduced from 3-5 ppm. to 0.2-0.5 ppm. And at the same time, various solids are taken out of the water. This work is the outgrowth of RAI's work with the Oak Ridge National Laboratory to separate radioactive metals by foaming (*CW, July 9, '60, p. 63*).

Other ABS removal techniques are being pioneered by projects sponsored by the Assn. of American Soap and Glycerine Producers. In one of these, at the University of California, 84% of ABS has been removed from water by frothing systems. In another test, at Johns Hopkins University, activated

carbon won out as the best adsorbent among those studied. But considerable work must be done before these ideas become practical.

Government Steps: Through a new federal law, municipalities can get more money in grants for sewage disposal plants. In the current fiscal year $80 million is available for such grants. And in fiscal '63, $90 million will be offered; $100 million each year in '64, '65, '66, '67. Each community can get as much as $600,000 vs. $250,000 formerly — thus, ABS-removing equipment may not be out of reach.

In a separate government action, the Surgeon General now recommends that the ABS content of water carried in interstate transportation not exceed 0.5 ppm. This recommendation may set a mark for state governments to follow—they have often followed the federal government's lead in the past. Such state action could result in political pressure on detergent producers.

In Germany, the proposal to outlaw nonbiodegradable syndets seems likely to be passed by the Bundestag. It would set June 30, '62, as the date after which only biodegradable detergents could be sold. The government would be able to dictate the type of detergents permissible and also the analytical methods used for the water. (The method of analyzing ABS is still not standard the world over and is still a problem.)

Roundup: The whole matter of cleaning up synthetic detergents from waste water is complex; it involves the chemical and detergent firms on one side, government and sewage plant people on the other, and the public in the middle.

Strong political action seems distant—if it is to occur at all—in the U.S. The problem is very spotty in the view of the detergent manufacturers, not so spotty in the opinion of sewage treatment people. Consequently, when a detergent formulation change comes (or a law is passed) it may be only regional.

But it seems clear that U.S. detergent makers will be reluctant to change things unless they can get an economical substitute for ABS. Either that or the foaming problem must become so bad that housewives will be willing to pay a premium for a new detergent. Since the problem is becoming appreciably worse only in isolated areas, the latter alternative is unlikely.

In any case, U.S. action is three or four years away. The slight increase in liquid detergent usage (instead of dry products) doesn't materially change matters. Although tridecylbenzene rather than dodecylbenzene is used—it is no easier to clean up.

There may be, however, a further decrease in alkylbenzene production in the U.S.—due largely to a decline in the export market. This in turn is caused by construction of new plants outside the U.S.—e.g., in Mexico, where Petroleos Mexicanos SA (Mexico City) plans a 60-million-lbs./year unit, and in Japan, where Mitsubishi Chemical Co. is building a 22-million-lbs./year unit. To U.S. producers, the export slack could stimulate still further the hunt for new and better products; a hunt that already engages many of the world's experts in surface-active agents.

EXPANSION

• California Research Corp., subsidiary of Standard Oil Co. of California, is adding two new buildings—valued at $800,000—to its research facilities at Richmond, Calif. The buildings will house pilot plant facilities (to be completed by October) and an engineering services laboratory (to be ready in December).

• Also in Richmond, Calif., Stauffer Chemical Co. has dedicated the new main building of its Richmond Research Center. The firm is constructing a complex of buildings on a 16-acre site.

• Dow Chemical Co. is starting construction of two laboratories in different states. The first major laboratory building at its research site in Walnut Creek, Calif., will be under way shortly; completion is expected in June '62. Main work there: new chemical compounds and processes. The other project is a styrene development laboratory now being built by Dow's Texas Division at Freeport. The new lab, to be ready by the beginning of '62, will include both product and process development.

• The 60-scientist staff of Union Carbide Corp.'s Research Institute is now housed in a new building at the firm's Eastview, N.Y., site near Tarrytown (about 25 miles north of New

CHEMICAL ENGINEERING SALES FILE
Re: Strategy for Boosting Sales /7

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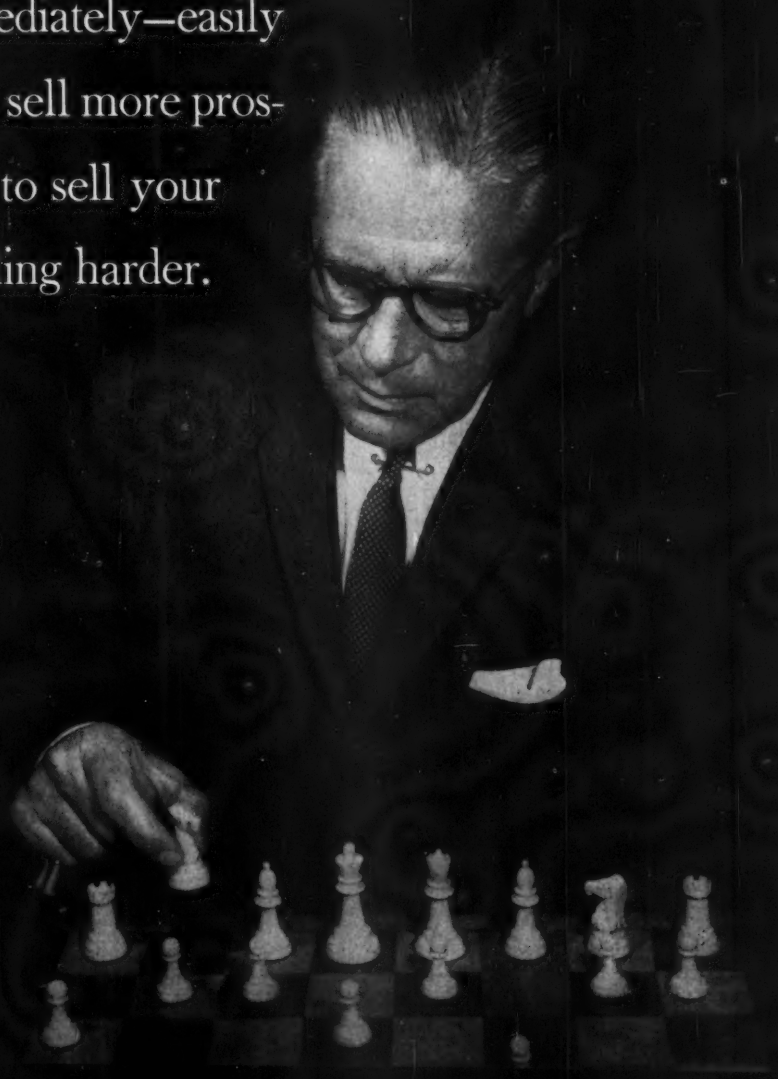


York City). The institute, previously in four separate laboratories, will conduct studies in the fields of organic chemistry, catalysis and high-temperature materials.

• Allied Chemical Corp.'s National Aniline Division is planning a 6,000-sq.ft. addition to its application research laboratory at Buffalo, N.Y. The new quarters will house equipment for development of rigid and flexible foams for industrial use.

LITERATURE

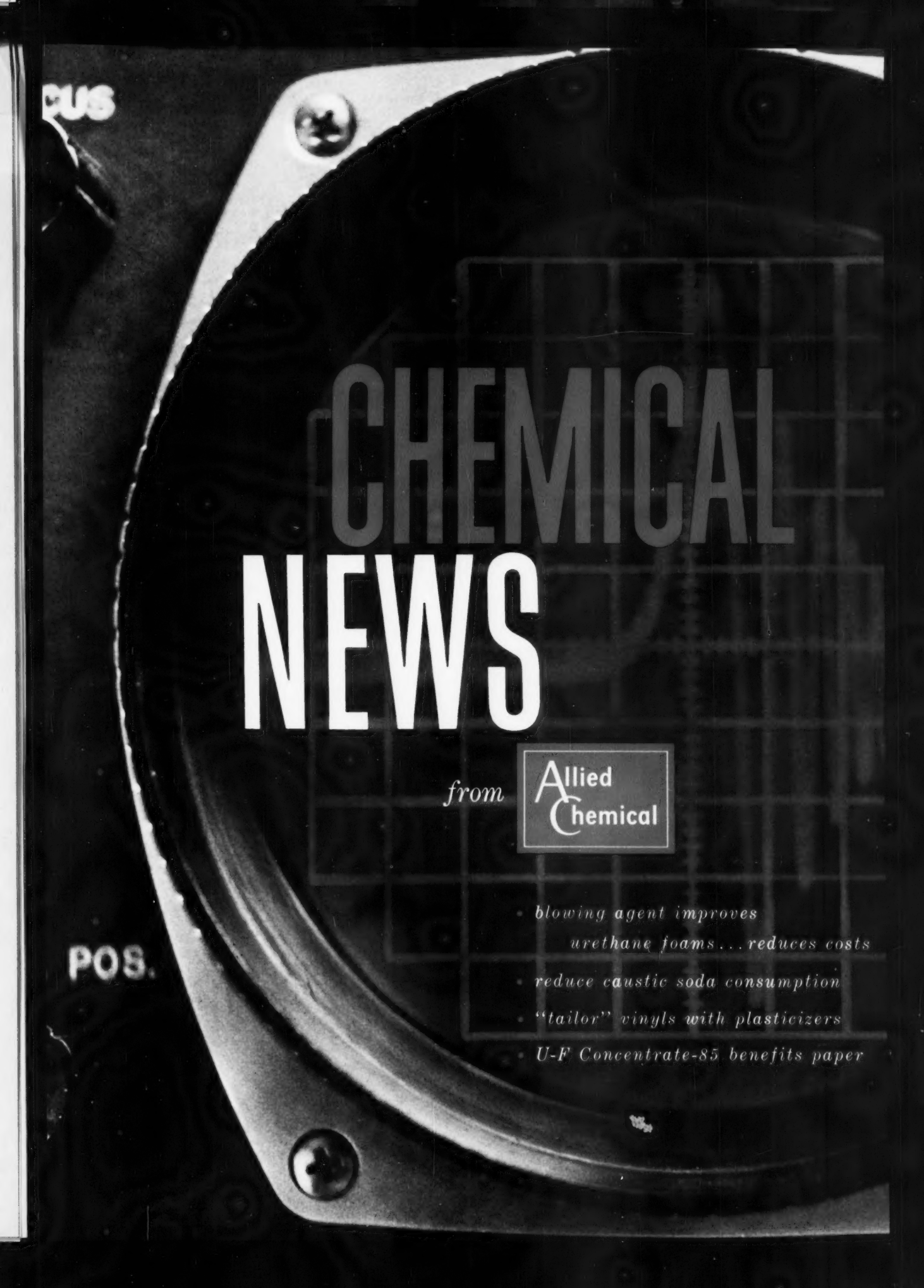
• A five-volume handbook on thermophysical properties of solid materials is being issued by Armour Research Foundation of Illinois Institute of Technology (Chicago). WADD Technical Report 58-476 (Macmillian Co., New York) covers elements, alloys, ceramics, cermets, intermetallics, polymerics and composite materials. Except for the last two categories, only those materials with melting points above 1000 F are included.

• The second edition of "Rare Metals Handbook," published by the Reinhold Publishing Corp. (New York), includes current data on 55 of the less-common metals.

• The Academic Press (New York and London), jointly with Verlag Chemie (Weinheim/Bergstrasse, Germany), will publish a monthly international (English) edition of *Angewandte Chemie*, beginning in Jan. '62. It will select original research articles, brief notes, reports of important European scientific meetings and book reviews from the semimonthly German edition.

• The Food Protection Committee of the National Academy of Sciences (Washington, D.C.) and the Toxicology Study Section of the National Institutes of Health will prepare, over an estimated five-year period, a National Food Chemicals Codex. Objective: to produce an authoritative reference work on methods of analysis and standards of identity and purity for chemicals used as food additives.

• An 804-page computer-indexed bibliography of 800 doctoral theses accepted by American Universities between 1861 and 1959 has been published by Stanford University Press (Stanford, Calif.). The bibliography, "Dissertations in Physics," was edited by Lois Marckworth of IBM (San Jose, Calif.).


CHEMICAL
NEWS
from
Allied
Chemical
• blowing agent improves
urethane foams... reduces costs
• reduce caustic soda consumption
• "tailor" vinyls with plasticizers
• U-F Concentrate-85 benefits paper

Urethane foams improved, production —with GENETRON® blowing

Rigid urethane foams with their superior insulating properties and structural advantages are winning widespread acceptance in the chemical process industries—to insulate pipes, ducts, storage tanks, tank cars, cold storage and critical laboratory areas, etc. And spurring urethane acceptance are Allied Chemical's GENETRON halogenated hydrocarbon blowing agents.

GENETRONS not only help slash production costs, but improve the inherently outstanding properties of the urethanes. When they replace carbon dioxide as the blowing agent, far superior insulating performance is obtained. The "k" factor (thermal conductivity) is cut in half. The extremely low thermal conductivity of GENETRON, entrapped in the urethane cells, gives GENETRON-blown urethane foams twice the insulation value of CO_2-blown foams, and two-and-one-half times that of glass wool batting. In addition, an approximate 50% dollar savings in raw material results from reduced thickness of the insulation layer and lower formulation cost.

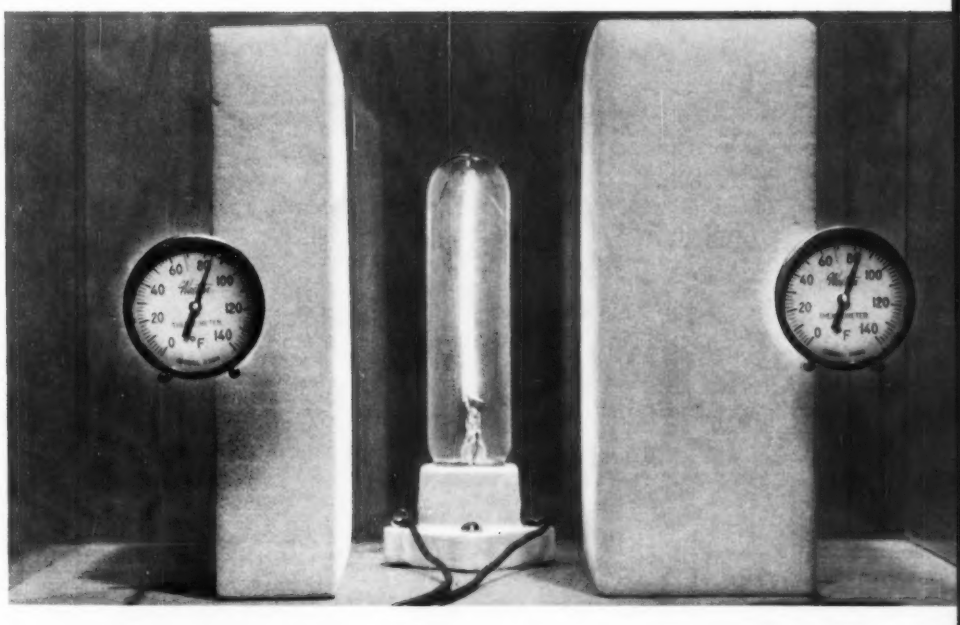
Other advantages! GENETRON-blown foams rise at lower temperatures, permit larger forms. They are easier to control since GENETRON does not react with other constituents. Density, too, can be more closely controlled. Less isocyanate is required, for it is used exclusively in the polymerization reaction and does not contribute to formation of the blowing agent. Genetron-blown foams also cure rapidly, even at room temperature, and they're safer to produce.

To utilize the foam-improving advantages of GENETRON blowing agents, write our General Chemical Division for product data or technical service.

Rigid urethane insulation foamed-in-place on chemical storage tank.

costs slashed

agents from Allied Chemical



Unretouched photo of simple laboratory test shows insulation superiority of GENETRON-blown foam—up to twice that of carbon dioxide-blown foam.

Chemical laboratory requiring critical temperature and humidity control being insulated with rigid urethane panels.

Urethane perimeter insulation in concrete slab construction reduces heat transmission.

All three major components of urethane foams: NACCONATE® diisocyanates, ACTOL polyethers, and GENETRON blowing agents are produced by Allied Chemical. We'll be glad to tell you more about urethanes in industry . . . about their structural strength combined with light weight, high adhesive strength, buoyancy, freedom from rot, resistance to water, aging, and chemical action.

■ **GENERAL CHEMICAL DIVISION**

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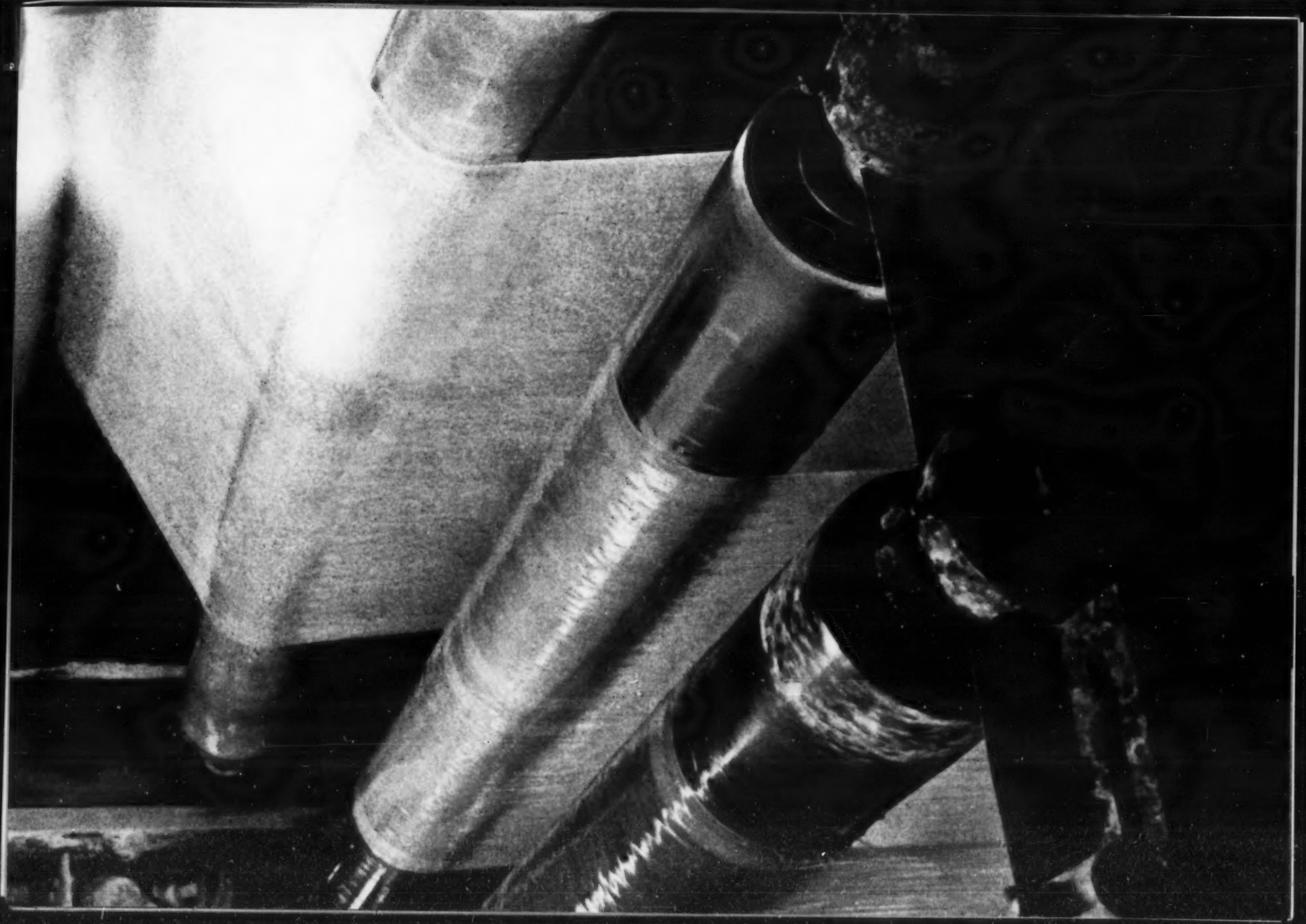

Solvay technician and chief chemist check efficiency of Solvay-designed caustic evaporator.

• *how Solvay works with customers to reduce consumption of caustic soda*

As a result of extensive improvement studies conducted by Solvay Technical Service in more than 50 bleacheries, caustic survey techniques have been perfected, mercerizer washing operations have been improved, caustic evaporation cheapened and a dialytic caustic purification process conceived.

From these developments have come drastic cost reductions—reduction or elimination of cloth shrinkage with increased yardage return and improved quality—usually without increasing steam plant capacity.

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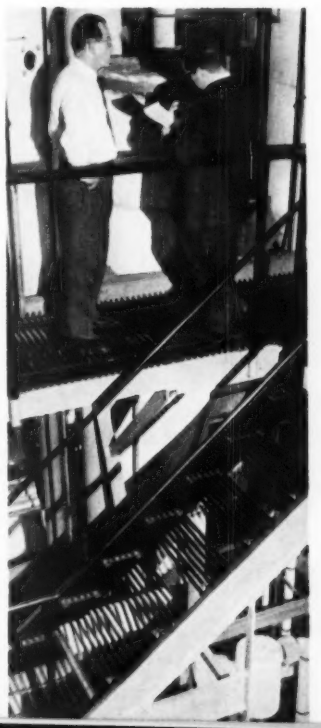


Photos courtesy
Fruit of the Loo

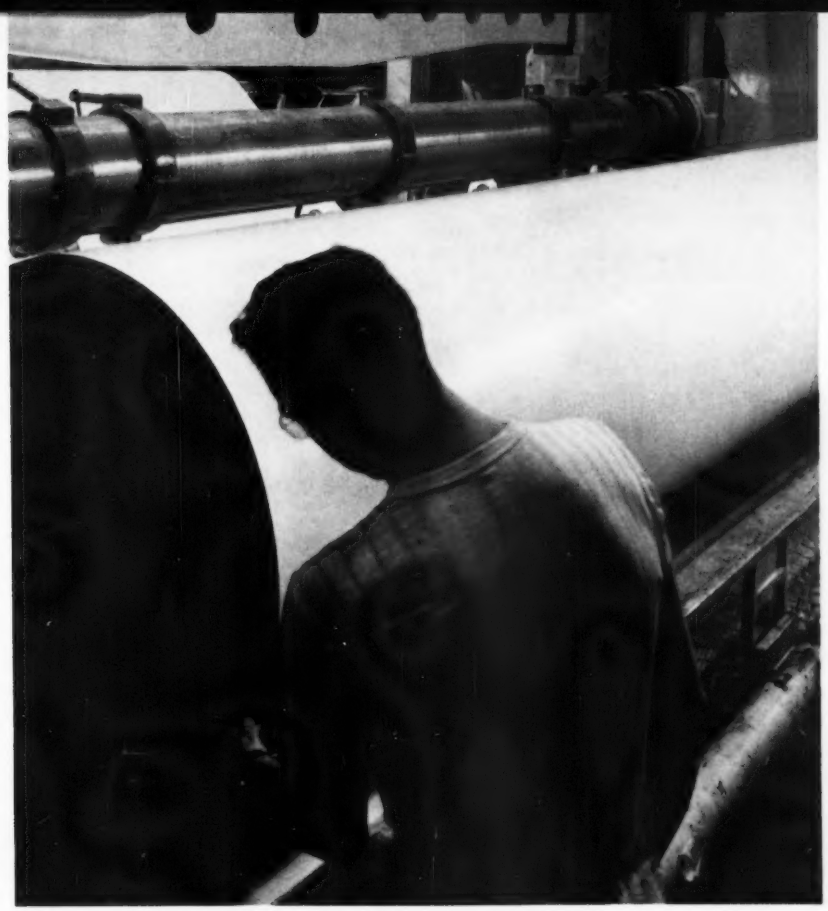
• *Now you can "tailor" vinyls to specific end-use requirements—with ELASTEX® plasticizers from Allied Chemical*

Eight items in this young lady's kitchen are vinyl. Floor tile, dish rack, gloves, apron, phone cord, electric iron cord, sink top and wallpaper—all are made of the same versatile plastic, yet, in each case, special properties have been "built-in" through the use of one or another of Allied Chemical's ELASTEX plasticizers.

For example, ELASTEX 90-P plasticizer is used in telephone wire because of its good electrical properties and volume resistivity—in dish racks, because it confers excellent viscosity to plastisols—in aprons and gloves, because it leads the phthalates in resistance to soapy water extraction. In vinyl counter-tops and wallpaper, ELASTEX 18-P plasticizer improves performance and color stability. In vinyl floor tile, ELASTEX 50-B, a high-solvating plasticizer imparting oil- and water-resistance, and ELASTEX 48-P, a versatile and economical general-purpose plasticizer, are used.

For further information on how ELASTEX plasticizers can help impart superior properties to your vinyl products, call or write to:

■ **PLASTICS DIVISION**



• *Allied Chemical U. F. Concentrate-85 adds paper coating improvement to many new uses*

Another important application for Allied Chemical U. F. Concentrate-85 has recently been demonstrated—this time in the paper industry.

Addition of a 25% concentration of U. F. Concentrate-85—a high solids content product of urea and formaldehyde—to starch-clay colors, results in better paper coatings, trial runs indicate.

Not only is the wet-rub resistance of the coated papers increased and printability improved but the new urea-formaldehyde product also has a unique preservative action. The formaldehyde contained in U. F. Concentrate-85 retards starch deterioration, sharply reducing unpleasant batch odors in hot weather.

Write for further information on this versatile product.

NITROGEN DIVISION

• *principal products for industry:* BARRETT DIVISION—Building Materials; ceiling tile, gypsum, insulation board, mineral wool, plastic panels, protective coatings, roofing, siding, urethane insulation. Paving Materials; bituminous concrete, paving sealers, road tars and asphalts, stone, sand and gravel aggregates, urethane insulation for bridges.

GENERAL CHEMICAL DIVISION—sulfuric and other commercial acids, alums, phosphates, fluorine and sodium compounds; BAKER & ADAMSON reagents and fine chemicals; GENETRON refrigerants, aerosol propellants, urethane foam blowing agents; agricultural insecticides, weed killers and specialties.

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NATIONAL ANILINE DIVISION—ACTOL polyethers; NATIONAL dyes and certified colors; HARMON COLORS (organic pigments); NACCONOL detergents, organic chemicals and intermediates, pharmaceutical chemicals; NACCONATE diisocyanates for urethane products; CAPROLAN nylon fiber.

NITROGEN DIVISION—ARCADIAN fertilizers, nitrogen solutions; PROCADIAN feed mixtures, ammonia, urea, ethylene oxide, ethylene and polyethylene glycol, ethanolamines.

PLASTICS DIVISION—coal-tar chemicals; PLASKON molding compounds, industrial and coating resins; A-C polyethylene; industrial tar products, including creosote oils, pitches, coatings, pipeline enamels.

SEMET-SOLVAY DIVISION—Coke and by-products; WILPUTTE by-product coke ovens and coal chemicals plants and engineering services.

SOLVAY PROCESS DIVISION—soda ash, caustic soda, potassium carbonate, caustic potash, chlorine, chloromethanes and benzenes, hydrogen peroxide; calcium, aluminum, ammonium chlorides; cleaning compounds; vinyl chloride; MUTUAL chromates.

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CW PHOTO—JOAN STULOW

T-CC's Gehman checks feel of aluminum-coated welder's glove.

New Coating Beats the Heat

This week Lee Gehman (picture, above), president of the six-months-old Thermo-Chem Corp. (Penndel, Pa.), is putting an unusually constructed welder's glove through its final test paces.

The glove, made of terrycloth and an aluminum coating offered by T-CC, is the first commercial application of the new heat-reflecting coating, which promises to find use in a wide variety of chemical plant jobs.

Already, several chemical firms are showing interest in its possibilities—for instance the material is being tested for uses such as: upgrading low-cost filter cloth (e.g., cotton twill) and urethane foam for more corrosive, higher-temperature filtration service; increasing asbestos insulation's thermal efficiency; reinforcing ceramic fibers at high temperature; lowering the cost of reflective garments (used in high-temperature maintenance work—e.g., handling salt-bath piping).

Some of the qualities of T-CC's aluminated* coating have emerged in tests of the welder's glove, made by Keller Glove Mfg. Co. (Plumsteadville, Pa.) and expected on the market soon.

Welders who have used the glove like its flexibility, whereas leather, the traditional welder's glove material, tends to stiffen when heated, becomes uncomfortable. Keller says the aluminated glove's cost will be competitive with leather gloves.

If the welder's glove gains acceptance, Keller will likely try the coating on asbestos protective equipment (e.g., aprons, sleeves, hoods) designed for maintenance men handling high-temperature equipment.

Sizing Up Costs: The keys to the new coating's potential are its low cost and porosity, says its inventor, John Sadden (*see picture, p. 85*). The compound is priced at 4½¢-8½¢/sq.ft. (cost will be lower for volume operations). It can be applied to any flexible material.

This price compares favorably with the more reflective, but more costly, aluminized coatings such as Minnesota Mining and Manufacturing Co.'s vapor-deposited type (which costs double that of the T-CC coating in some cases) and the familiar glued aluminum foil (which costs about 8¢/sq. ft. for a 6-mil-thick foil).

However, T-CC's aluminated coating will have stiff competition from 3M's material in applications such as safety suits where the latter's coating is considered a leader.

Until a patent issues, both Sadden and Gehman are understandably chary about discussing details of the process. But they will say this much: basically the process uses an aqueous-based binder combined with an aluminum powder (although other metals such as bronze, copper, silver or gold may be used). The binder-powder combination penetrates into the pores of the base material (up to 3 mils deep for close weave, all the way through open weave) without closing them. Result: a flexible, reflective coating with good resistance to cracking and abrasion.

To check some of the coating's

* Actually, aluminated and aluminized are synonymous; but T-CC prefers to refer to its material as aluminated.

Gehman and Sadden check sample of aluminated urethane foam.

properties, Sadden and Gehman have run some preliminary tests themselves. And they have had more detailed tests run by an independent testing company. To date, T-CC has found the binder impervious to temperatures up to 2500 F and to 20% caustic and dilute chlorine at room temperature. As expected, the aluminum (because of its poor caustic corrosion resistance) failed in less than a day in the caustic. Testing was limited to temperatures below aluminum's melting point.

The independent testing company went further, checked the coating's reflectivity, flexibility, resistance to cracking and abrasions. Results were favorable — e.g., the lab found that underwriters'-grade asbestos with the aluminated coat sustained over 20,000 flexes through a 180-degree bend (in the warp direction) without cracking. The coating was 20 times more reflective than uncoated asbestos but not as reflective as sheet aluminum. It was reportedly slightly less than 90% reflective. Furthermore, the coating showed no color or flexibility change after five days at 220 F. In addition, the coated fabric took over 2,000 cycles under a rough Aloxite abradant before a hole appeared.

Synthetic Substitute: Chemical filtration experts and the filter-fabric makers are making their own tests, checking the coating out as a possible substitute for more expensive filter media (e.g., synthetic fibers such as Dacron and nylon). Untreated cotton twill filter cloth won't last long at temperatures above 250 F, or in acid or caustic solutions, but the aluminated cloth might. At present, for these conditions, chemical plant men are forced to use synthetic fiber filter cloth, with costs four-five times more than cotton of the same weight.

Furthermore, Sadden claims that the T-CC process can control the porosity of the coated fabric—a necessary requirement for filter cloths. Any slight pore closure by the coating can be compensated for by using a cloth of more open weave.

Open-pore urethane foam is another potential filter material currently under investigation by at least one large East Coast chemical firm. Potential application: acid demisting. Chemical firms now use expensive alloy metal (e.g., Monel) to remove acid mists present in the hot vapors that come from distillation towers. Replacing Monel metal with T-CC's coated urethane foam could cut the cost of a 6-ft. diameter, 4-in. thick demister from $2,000 to $400 per unit.

Uncoated urethane has been unsatisfactory because it degrades in acids, caustics or chlorine vapors and at temperatures above 275 F. According to Gehman, a block of aluminated urethane appears unchanged when removed from an oven after four hours at 400 F.

Although not directly applicable to chemical plants, the proposed use of aluminated urethane as a building material could bring the coating cost down, widen its use in other applications. Gehman predicts that the coating will give urethane added tensile strength and heat reflectivity, as well as improved appearance.

The T-CC coating will likely improve asbestos insulation's heat reflectivity as well. A large Delaware Valley insulation manufacturer is trying it as a backing material on asbestos. It hopes that the improved thermal efficiency will yield a low-cost, thinner insulation for those areas where space is at a premium.

The coating might also make a good backing for ceramic fibers. This ceramic material is a lightweight, low-thermal-conductivity, high-temperature (2000 to 3000 F) insulation for specialized units (e.g., superheaters). The aluminated coat is being checked out as a cold side reinforcement. It could make it stronger at high temperatures, thereby extending the ceramic's temperature range.

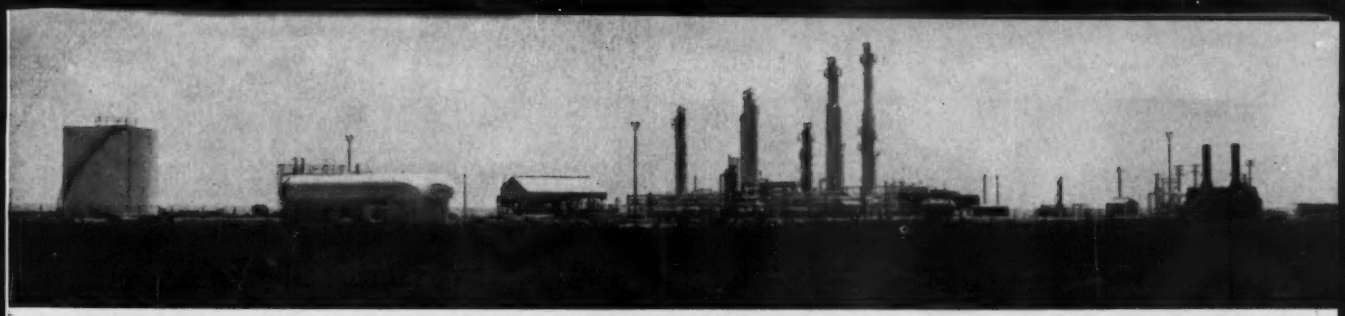
Other Hurdles: Before the new coating can make much headway in chemical plant applications there are difficulties to be overcome:

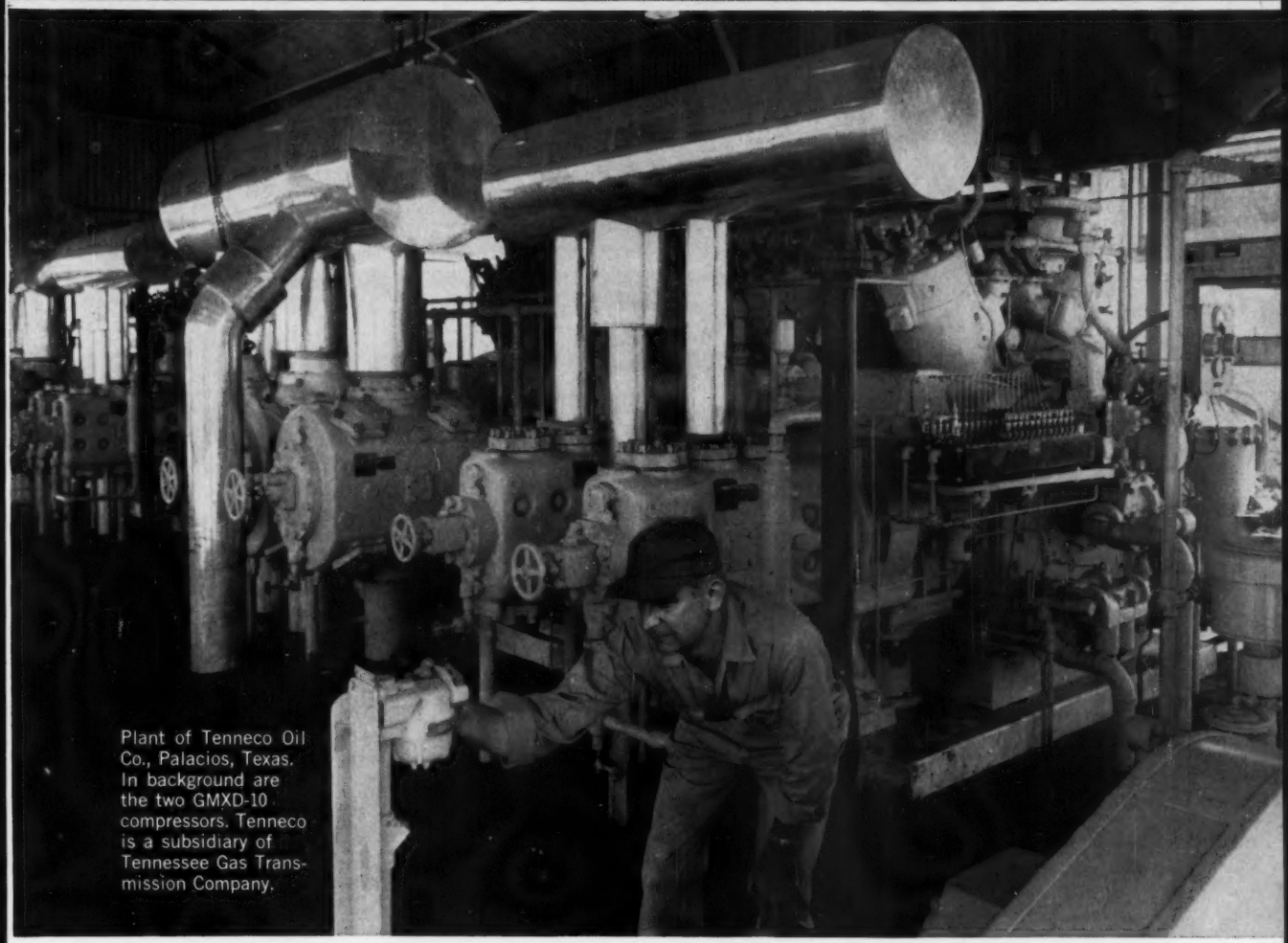
(1) More exact information on its limitations is needed, and this requires further testing by the users and T-CC.

(2) Although T-CC has insisted on doing all the coating itself, Gehman recognizes that any large-volume customer will want to do its own coating. Therefore, T-CC will have to drop the veil of secrecy on the process and license other firms to do the coating.

(3) At least one chemical company found that the coat was not as reflective as conventional aluminizing processes (which have over 90% heat reflectivity). This is one problem that users of the new coating may have to live with. Because the coating is porous, the natural roughness of the base material tends to cut reflectivity. T-CC is developing a waterproofing compound that would be needed if the coating is applied on outdoor installations such as insulation.

None of these difficulties is insurmountable, however, and T-CC will likely have a lot of help from firms anxious to try the new coating. Even if all the drawbacks cannot be eliminated, the material apparently could still fill a number of jobs in chemical process plants.





Plant of Tenneco Oil Co., Palacios, Texas. In background are the two GMXD-10 compressors. Tenneco is a subsidiary of Tennessee Gas Transmission Company.

Compressors handle heavy load in low-temperature processing

Compression facilities of the new Tenneco Oil Company plant at Palacios, Texas, were designed for 55 mmcfd. Its two Cooper-Bessemer compressors are now handling 70 mmcfd, 'round the clock.

This low-temperature oil-absorption processing plant went on stream January, 1961, and soon reached, then surpassed its rated capacity. It will soon be expanded to 90 mmcfd.

Its two 660 hp Cooper-Bessemer GMXD-10 compressors, shown above, are giving exceptional service under these severe conditions. Each unit has two stages in refrigeration for processing and two stages in booster service for returning gas to supply lines.

Find out how the complete line of Cooper-Bessemer products can assure peak performance for *your* compression or power facilities.

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Purple martins fleck the sky over Humble's Baton Rouge refinery.

Night Shift—It's for the Birds

Each evening as darkness begins to enfold the banks of the Mississippi River, thousands of birds come wheeling and darting from the sky to settle on the pipe stills of Humble Oil & Refining Co.'s huge Baton Rouge, La., refinery. Within a few weeks the birds will leave to winter in Central and South America. But next spring they'll return.

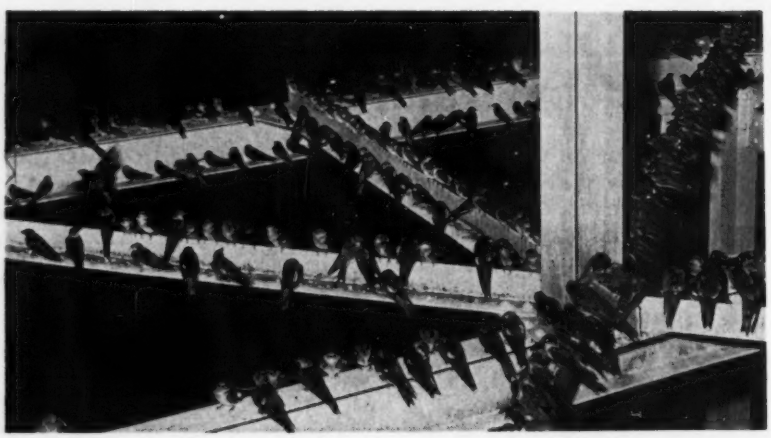
The birds, which make up the entire purple martin population of Baton Rouge, present a housekeeping problem for the pipe still operators. Although the birds have been routed from some refinery process units, they've never been completely dislodged from the area.

The purple martins nest throughout the city during the day. But in the evening their natural sociability takes over and they fly to a communal roost, which for a number of years has been at the refinery. When their first roosting place, a large gas holder, was torn down several years ago, the martins moved to the refinery's new Hydroformer.

The Hydroformer crew, unwilling to put up with the dirtying of the new units, tied an owl to the structure, followed this by playing a record of martin distress cries to scare the birds away.

But after their winter migration, the martins moved onto the pipe stills, where they appear to have found a permanent, made-to-order roost—unless, of course, Humble finds still another way to make the martins move.

It just goes to show that a company often must cope with a plant management problem that's not found in the operating manual.



Birds roost on pipe still superstructures during summer nights.

Now Cyanamid Offers a Series of Cyquest* Sequestering Agents

to help remove traces of unwanted metallic ions—Check this chart... there's a Cyquest Sequestering Agent best for you

Sequestering Agent	Chemical Composition	Use
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CYQUEST* 40-D	Tetrasodium ethylenediamine tetraacetate dihydrate	Used in place of Cyquest 40 when a dry form is needed.
CYQUEST* ACID	Ethylenediamine tetraacetic acid	Used in place of Cyquest 40 when the sodium ions are undesirable.
CYQUEST* 30-HE	Trisodium N-hydroxyethyl-ethylenediaminetriacetate solution	For control of iron in the alkaline ranges from pH 6.5 to 9.5.
CYQUEST* DEG	Sodium dihydroxyethyl glycinate	For iron control in alkaline range from pH 9.5 to 12.5.

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EQUIPMENT

Canned Pump: A new line of centrifugal, totally enclosed pumps has been offered by Buffalo Forge Co.'s Buffalo Pump Division (Buffalo 5, N.Y.). Each pump has a tapered carbon bearing with a wear compensating spring, which, according to BFC, has a potential five-year life, reported to be much longer than radial bearings. The new pumps, called Can-O-Matic, are hermetically sealed for use with toxic, flammable, or highly volatile liquids. They are available in 13 sizes with 1- to 5-in. discharges, for 120 psig. and 40-250 F temperature. Standard construction includes cast iron casings, bronze impellers, and 304 stainless-steel stator cans, shafts and rotors.

•

Plastic Tank: Jones & Hunt Inc. (Gloucester, Mass.) is marketing a new line of large — greater than 6,500-gal. capacity — glass-fiber storage tanks. Liquid level gauging is simplified because the tanks are translucent. Because of its insulating qualities, glass fiber eliminates sweating, cuts outdoor lagging. The tanks are inert to most chemicals, don't require painting.

•

Heat Exchanger: A new high-pressure, double-pipe (hairpin), fintube heat exchanger has been introduced by Brown Fintube Co. (300 Huron St., Elyria, O.). Brown claims higher operating pressures are possible — up to 6,000 psi. for tube and 1,800 psi. for shell, compared with 500 psi. in other fintube designs. Because one multifintube unit has higher heat transfer capacity it can replace as many as four conventional units, Brown claims. Tight closure is obtained by using metal sealing rings with either Van Stone or lap joint-type flanges.

•

Rotameter Transmitter: Schutte & Koerting Co. (Cornwells Heights., Bucks County, Pa.) is offering a new line of electric rotameter transmitters. One of the transmitter's five available dc. output signals can be tied into most electric receivers or computers. The new transmitters, which are contained in a metal housing directly coupled to S&K's Safeguard metal tube rotameters, operate on an induction principle. The new line can measure and transmit flows up to 200 gpm. at pressures up to 600 psi.

•

Insulation Technique: Johns-Manville Co. (22 East 40th St., New York 16) is offering a preformed metal band, called Miter-Seal, as a new technique in applying jacketed pipe insulation. The technique is said to simplify the insulation of fittings and bends and to reduce the inventory of preformed humped elbows and fitting covers. Straight lengths of aluminum-covered insulation are sawed to the proper angle, then joined by the metal bands and clamped with a banding wrench. The Miter-Seals are designed for use with pipe ¾ to 24 in. in diameter.

•

High-Speed Valve: A new high-speed 3-in. valve that opens in 15 milliseconds, developed originally for the aircraft industry by Research, Inc. (Box 6164, Minneapolis 24), is now available to the chemical industry. RI suggests the valve may be used wherever exceptionally fast valve action is necessary — e.g., for rapid buildup or release of pressure in a pressure vessel. The valve orifice is closed by a poppet held in place by a double-toggle assembly. When a solenoid plunger starts to move, it trips the toggle assembly, which releases the poppet and opens the valve. The valve is produced in 3-in. size for 1,500-psi. operation.

•

Electrical Connector: Hermetic Seal Corp. (North Arlington, N. J., Rosemead and Pasadena, Calif.) is offering a new nonmagnetic, hermetically sealed electrical connector that will withstand instantaneous temperature changes from 600 F to —320 F. The unit can be used to make electrical connections with hermetically sealed devices such as gyroscopes and pumps.

•

Coated Fabrics: Fabrics coated with Fluorel (a fluorinated synthetic rubber) are now offered by Minnesota Mining and Manufacturing Co.'s Irvington Division (St. Paul). The coated fabrics, said to be inert to most chemicals, are nonflammable, have good weather-resistance. The coating will withstand temperatures from —100 F to +400 F without physical change, is available with either glass or Dacron as a base fabric.

Shell has three benzene-producing refineries, located near waterways. Barges like these will carry the bulk of 1961's record output.

BULLETIN:

Shell has increased benzene production to meet your rising needs—capacity now exceeds 80 million gallons per year

Shell has increased its benzene production nearly 500 percent in less than 18 months. Shell's benzene-producing capacity in the U. S. is now the largest in the world.

Shell's stepped-up output comes to you via a nationwide supply network served by 3 refineries.

Read how Shell's increased benzene production can help you meet your rising benzene requirements now.

WITH DEMAND for benzene at an all-time high, and with new uses coming along each year, Shell is producing more benzene now than ever before.

Bigger supplies now

Shell has stepped up production of benzene again. Shell's capacity has already topped 80 million gallons of high purity benzene. *And Shell has nationwide facilities for producing and distributing benzene.*

Widest distribution

Shell Benzene is produced at three refineries. At Wood River, Illinois; Houston, Texas; and Wilmington, California.

NOTE: All three refineries are located near waterways. You can take delivery of Shell Benzene in barges, in tank cars and transport trucks. Deliveries can come direct from the refinery.

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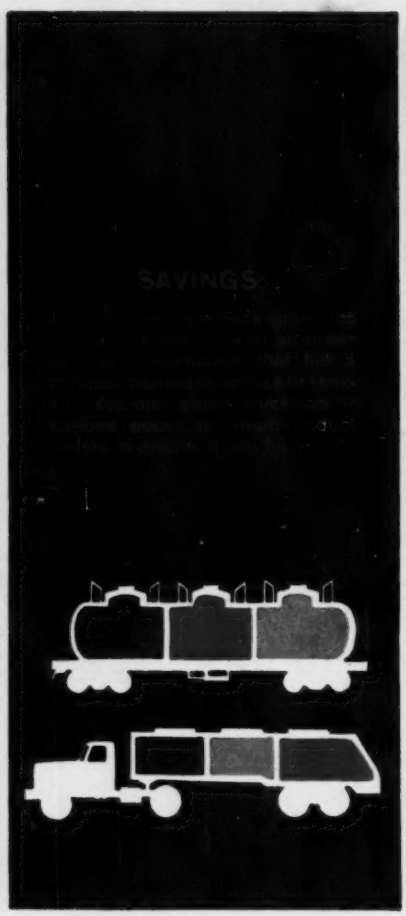

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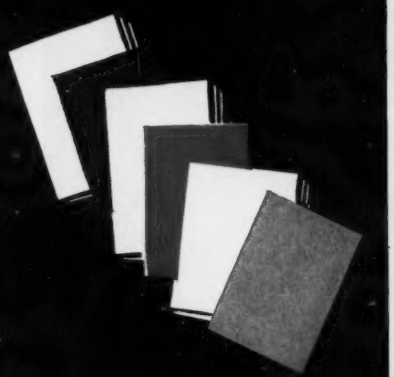
MONOMERS

LITERATURE:

Rohm & Haas technical literature gives information on polymerization mechanisms, copolymerization, catalysts, physical and chemical properties.



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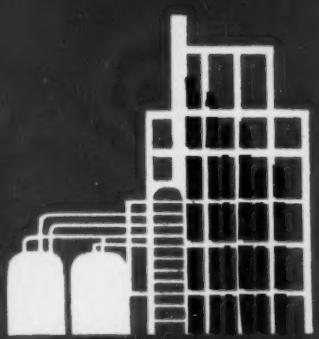

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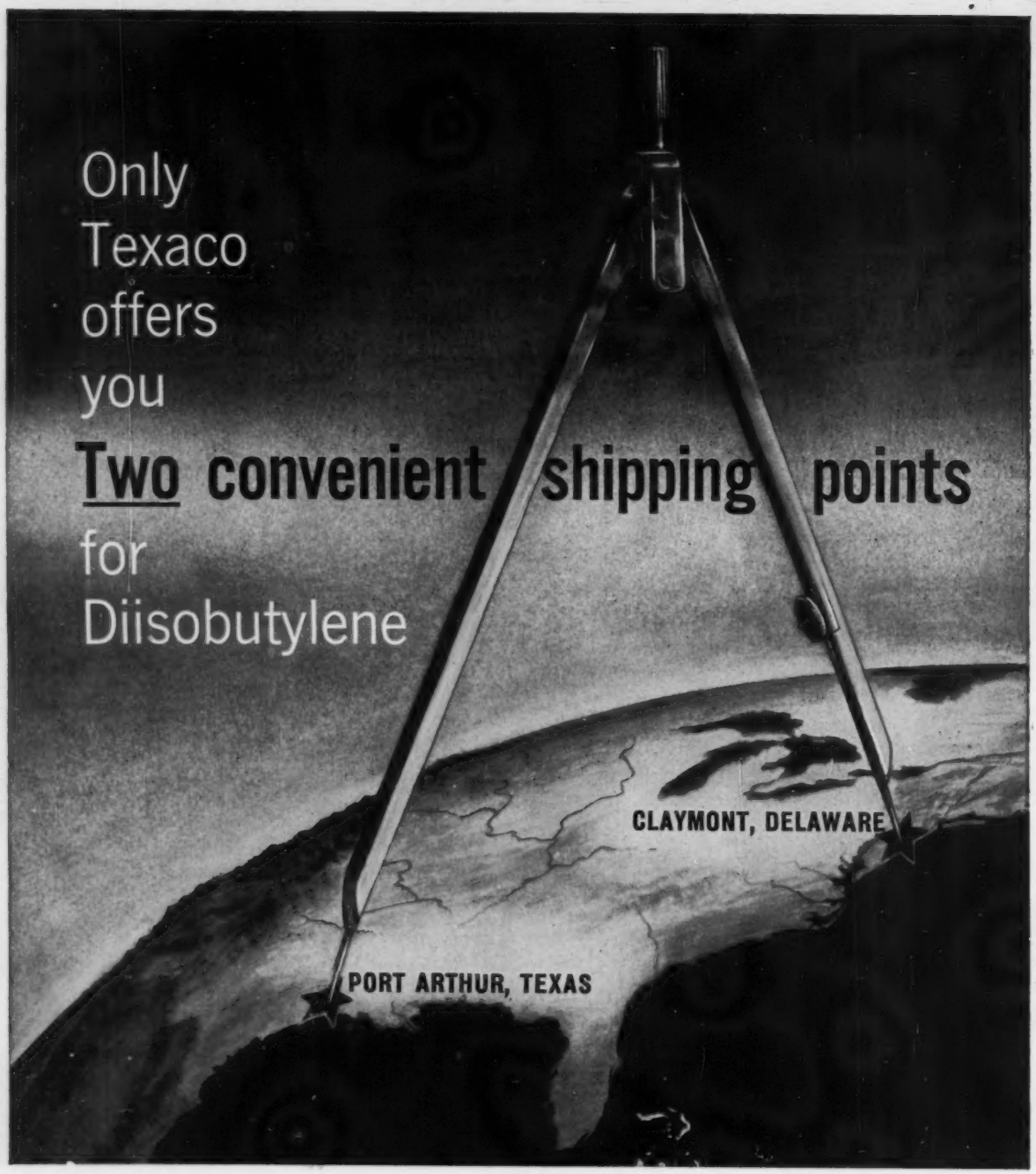
*available in development quantities.



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Suggestion System Awards

Yearly total awards (dollars in thousands) and number of companies reporting (in parentheses)

Company Classification	'60	'59	'58	'57	'56	'55	'54	'53
Petroleum and coal products—basic chemicals	$438 (8)	$402 (7)	$406 (8)	$443 (7)	$417 (5)	$378 (7)	$719 (14)	$258 —
Pharmaceuticals and chemical products	477 (18)	509 (20)	640 (18)	604 (17)	494 (15)	407 (14)	70 (11)	442 —
Other chemical process industries firms	673 (16)*	659 (19)	662 (19)	794 (17)	798 (17)	675 (12)	660 (12)	386 (12)
Totals	1,588 (42)	1,570 (46)	1,708 (45)	1,841 (41)	1,709 (37)	1,460 (33)	1,449 (37)	1,086 —

*Firestone, General Tire & Rubber, Goodrich, Goodyear, Anaconda, Consolidated Mining & Smelting Co. of Canada, Kennecott Copper, National Lead, St. Joseph Lead (Zinc Division), Eastman Kodak, Norton Co., Owens-Corning Fiberglas, Owens-Illinois Glass, Ruberoid, St. Regis Paper, Scott Paper.
Source: National Assn. of Suggestion Systems (Chicago).

Setting New Records in Suggestion Payoffs

A new survey, source of the '60 figures (above), points up the continuing growth of suggestion systems in industry and government. Such plans haven't been particularly popular in chemical companies, where the emphasis traditionally lies in formal research. But this trend will likely change, as demands for cost-cutting and profitable new ideas increase.

Allied Chemical, for example, is now installing its first suggestion plan. And International Minerals & Chemical is trying out a new type of plan that not only is a source of useful ideas but also helps IMC promote its corporate image.

Survey Highlights: The annual survey made by the National Assn. of Suggestion Systems (Chicago) among its members in industry and government asks a battery of questions (e.g., Is your suggestion administration a separate and independent department?), lists total and average award payments for employee ideas. This year Frank Owens and William Krewatch, of Du Pont's Engineering Dept., handled the survey for NASS.

NASS' chemical members—grouped as petroleum and coal products, basic chemicals (Group 10) and pharmaceuticals and chemical products (Group 11)—paid out $914,921 for usable suggestions in '60. Group leaders: Standard Oil (New Jersey), $351,091 total, $34.64 average payment; and Du Pont, $278,270 and $38.84.

These groups' awards were part of the $15.7 million paid by all 237 members reporting, including $5 million reported by General Motors, which topped even the $2.8 million awarded by all federal agencies in '60. (Not all NASS members answered the survey, nor are all companies that have suggestion systems members of NASS.)

The total dollars awarded has increased steadily during the past six years. Last year's awards totaled 9% more than '59's and 42% over '55's. The average award was $33.48 in both '59 and '60, compared with $30.22 in '55.

While the number of individuals submitting suggestions has averaged close to 175 for each 1,000 eligible employees during the past five years, this ratio jumped sharply (to 210, up 20%) in '60.

Notes the report: "It is reasonable to conclude that the figures clearly reflect improvement in suggestion system administration and that the increase in savings (to management) from '55 to '60 at least parallels the 30% increase in award dollars per thousand eligible employees."

Lone-Wolf Opportunity: Allied's plan is being mentored by Ralph Daschke, former NASS president, who managed American Cyanamid's suggestion plan. (Cyanamid awarded $72,725 in '60.) Daschke believes that the "chemical industry has relied more on its research facilities and abilities than on suggestion systems. It has never realized that the two can work hand in hand."

The catch, as Daschke sees it, is that many inventors are of the lone-wolf type, are not in formal research organizations. Researchers pick their vocations early in life, acquire certain training and skills. Employees who are too old to start research careers or don't care for research as a full-time occupation do not participate in formal research. But they may be capable of producing occasional valuable cost-cutting, new-product, or other ideas. The suggestion plan gives them an opportunity to capitalize on this talent.

Daschke lists two pointers for achieving success with suggestion programs:

(1) Ideas should be submitted in writing, and each idea submitted must receive an answer. That way, he says, "no ideas will be forgotten by a supervisor harassed by production schedules or other problems. And the ideas usually receive more considered judgment."

(2) Cash awards should be offered as incentive to submit ideas. Seniority, shop rules, union rules, proximity to retirement, etc., all have a bearing on promotion, but a cash award may be an incentive for a man to turn in ideas, whereas hope of promotion may not be.

Image Builder: While cash is by far the most popular means of rewarding employees for usable sug-

gestions. International Minerals & Chemical offers Go-F'r bucks—scrip redeemable in prizes—for suitable "growth" ideas. Each idea can earn up to $3,000 in Go-F'r bucks, which IMC says is equivalent to $4,200 worth of merchandise.

Early this year IMC called in John Plain Co. (Chicago), a firm specializing in handling incentive plans, enlisted its help in setting up a suggestion system that would also help IMC personnel achieve a better grasp of company objectives and to relate more closely to their employer.

IMC wanted a slogan that would combine both the aspirations of the company and those of employees in its far-flung holdings (e.g., in the Skokie, Ill., headquarters and in Florida, Alabama and New Mexico). The firm picked "Go-F'r Growth," subsequently abbreviated to "Grow."

Employees were bombarded with letters (over IMC president Thomas Ware's signature) and other promotional material, asked for suggestions that would help IMC live up to its slogan.

IMC has about 5,000 employees. After 90 days the company has received 8,404 suggestions. Among them: a method to blend "fines" into rock phosphate to produce higher assay fertilizer; and a simplified technique for cleaning burner igniter lances (estimated annual savings: $12,357).

Now the firm is extending its "Grow" campaign (somewhat like International Business Machines' "Think"). It plans to paint the "Grow" symbol on plants, use the theme in a safety program, promote it in advertising, use it in speeches, etc.

Matter of Choice: Approaches to the use of suggestion systems vary widely among chemical process companies. Texas Eastman (Longview, Tex.), division of Eastman Kodak, for example, rewards useful ideas whether or not they produce tangible savings to the company. Intangible (e.g., safety improvements) suggestions receive a flat payment (minimum $10). Where savings can be shown (e.g., in process improvement), the employee receives 15% of the savings the first year, 7½% the second. An employee is limited to one award each year at a maximum payment of $7,500.

In '55, 1,209 suggestions were turned in for each 1,000 employees. In '60 the rate was 1,717/1,000. Last year the company adopted 42.5% of all suggestions submitted. Largest single award: $2,500.

Eastman Kodak awarded $318,004 for ideas in '60, slightly more than in '59. The highest award was $5,100, split three ways among members of the engineering division at the Kodak Park Works (Rochester, N.Y.). They suggested an improved method of cost classification for engineering and construction projects. Item: Kodak's suggestion system, one of the oldest, dates back to 1898, has paid out $4,668,004 so far.

Dow Chemical's Texas Division does not have a formal suggestion plan but does have a "work simplification program" under which employees offer suggestions for process improvements, etc., to supervisors, who meet every two weeks to discuss them. No cash is awarded for ideas that are adopted. The employee is usually written up in the company publication and receives a certificate from his department head.

Humble Oil's "Coin-Your-Ideas" program has been in effect 30 years. An employee writes his idea on a form, submits it to his local "Coin-Your-Ideas" committee, which meets once a month. Ideas having merit are forwarded to a departmental committee and ultimately to a central committee, which meets once each quarter, reviews suggestions and sets the amount of the awards.

An idea may win an initial award up to $200. After it has been in use for one year, it may win a supplemental award of up to $1,200. After two years, if the idea has sufficient merit, there may be an additional "Capital" award up to $500. There is no limit to the number of initial and supplemental awards given, but only one capital award is made in each department each year.

Du Pont does not operate a company-wide suggestion system from its Wilmington headquarters, but some Du Pont departments have suggestion systems.

Tidewater Oil (Los Angeles) conducts an annual suggestion award competition among its nearly 10,000 employees in the U.S. and abroad. The prize awarded this year (for the best suggestion in '60) amounted to $465, was for a refinery processing modification involving hydrodesulfurizer equipment. The winner, an operator at the company's Delaware refinery, received an initial award of $930 (based on the idea's estimated savings) and a second award of $280 when his idea was selected as the best from employees of the Eastern division. This also qualified him to compete with Tidewater personnel in other divisions for the top prize.

What's the Cost? Setting up a suggestion system can be relatively inexpensive, but cost ultimately depends on how well the program is accepted by employees. If employees are enthusiastic and report numerous ideas that lead to lower costs or higher profits, the program easily pays for itself. If employees are indifferent, administrative costs (salaries of people handling the program, costs of suggestions boxes, posters, forms, etc.) won't be justified.

Harold Bostock, NASS president, says that ideas that cut production time, eliminate waste time or material or reduce maintenance costs, are usually the most valuable to a company. He believes that the "explosion" in the growth of suggestion programs during and since World War II will continue. While chemical companies haven't all been boosters of the plan, rising research costs (*CW, Feb. 4, p. 57*) and other factors may stimulate their flagging interest.

Price-Fixing Upshots

The state of Maine has accepted a $215,000 settlement in its $1.5-million suit against six out-of-state tar and asphalt suppliers. Koppers and Allied Chemical, the only companies involved in the cash settlement, also agreed to pay a total of $21,498 to 15 Maine towns to whom they sold tar and asphalt.

Suits against three other firms were dismissed by the state's attorney general because they had not made any sales in Maine. They were Trimount Bituminous Products Co. (Everett, Mass.); H. H. McGuire & Co., Inc. (Malden, Mass.), and Independent Coal Tar Co. (Framingham, Mass.). A suit against James Huggins & Son, Inc. (Malden, Mass.) is awaiting dismissal.

The state of Maine sought recovery of funds it claimed it lost over a four-

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year period as a result of price fixing. During that time the state bought about 13 million gal. of tar from Koppers and Allied.

The six firms were sued in Maine after they had been convicted in a federal court in Massachusetts on price-fixing charges. U. S. District Judge Edward T. Gignoux was arbiter and moderator during the Maine negotiations.

In another price-fixing development, the city of Chicago's purchasing agent, John Ward, has been quoted in Chicago newspapers as saying that the city will save $100,000 on salt purchases this year as a result of recent federal price-fixing indictments of the nation's four largest salt suppliers. All the latest bids received were substantially under the bid figures of previous years, and all of the companies entered different bids, according to the report.

Morton Salt had landed the Chicago contract in recent years because its prices were no higher than its competitors and because it is a local firm (local companies are favored by Chicago city purchasing policy when bids are the same).

Last year Morton Salt won with $10.72/ton; this year, the low bid of $8.10 was submitted by International Salt. International's 20,000-ton order is for delivery to city storage at Lake Calumet and also at the Chicago River, just east of Michigan Avenue. Another bid—for delivery by the contractor "where the city needs it," also for 20,000 tons—was won by Morton Salt with a low bid of $9.33/ton.

LABOR

Two-Year Agreement: Approximately 250 production and maintenance employees in U.S. Rubber Reclaiming Co.'s Cheektowaga, N.Y., plant are covered by a new two-year agreement with Local 222, United Rubber Workers. The new contract provides a 3½¢/hour wage increase retroactive to June 19, '61, and a 4¢/hour increase effective June 18, '62. Employees are eligible for three weeks' vacation after 10 years' service, and four weeks after 22 years.

●

Arbitration Revision: Members of Lodge 2112, International Assn. of Machinists, have accepted a new contract providing an immediate pay increase of 6¢/hour for production and maintenance workers at Hooker Chemical's Durez Plastics Division in North Tonawanda, N.Y. The contract, which runs through May 31, '63, provides another 6¢ increase June 1, '62. About 650 employees are covered by the new agreement. The former five-man arbitration board has been replaced by one neutral arbitrator, who presides at hearings, and four advisors—two from the company and two from the union; the advisors do not have voting power. The company has agreed to pay any increase in Blue Cross or Blue Shield premium rates during the contract.

KEY CHANGES

James Fletcher to executive vice-president, **G. A. Rehm** to vice-president of engineering, **Hugh G. Dean** to vice-president of sales, Springfield Boiler Co. (Milwaukee).

Gardiner Symonds to chairman of the board, **Paul L. Davies** to vice-chairman, **W. N. Williams** to director, Petro-Tex Chemical Corp. (Houston).

Hulbert W. Tripp to the board of directors, Pfaudler Permutit, Inc. (Rochester, N.Y.).

Thomas M. Rasmussen and **George F. Wingard** to assistant treasurers, Monsanto Chemical Co. (St. Louis).

Lowell E. Krieg to corporate vice-president and general manager, Winchester-Western Division (New Haven, Conn.), Olin Mathieson Chemical Corp.

William A. Romain to president, Novo Industrial Corp. (Chicago).

Alonzo B. Kight to president, Borg-Warner International Corp. (Chicago).

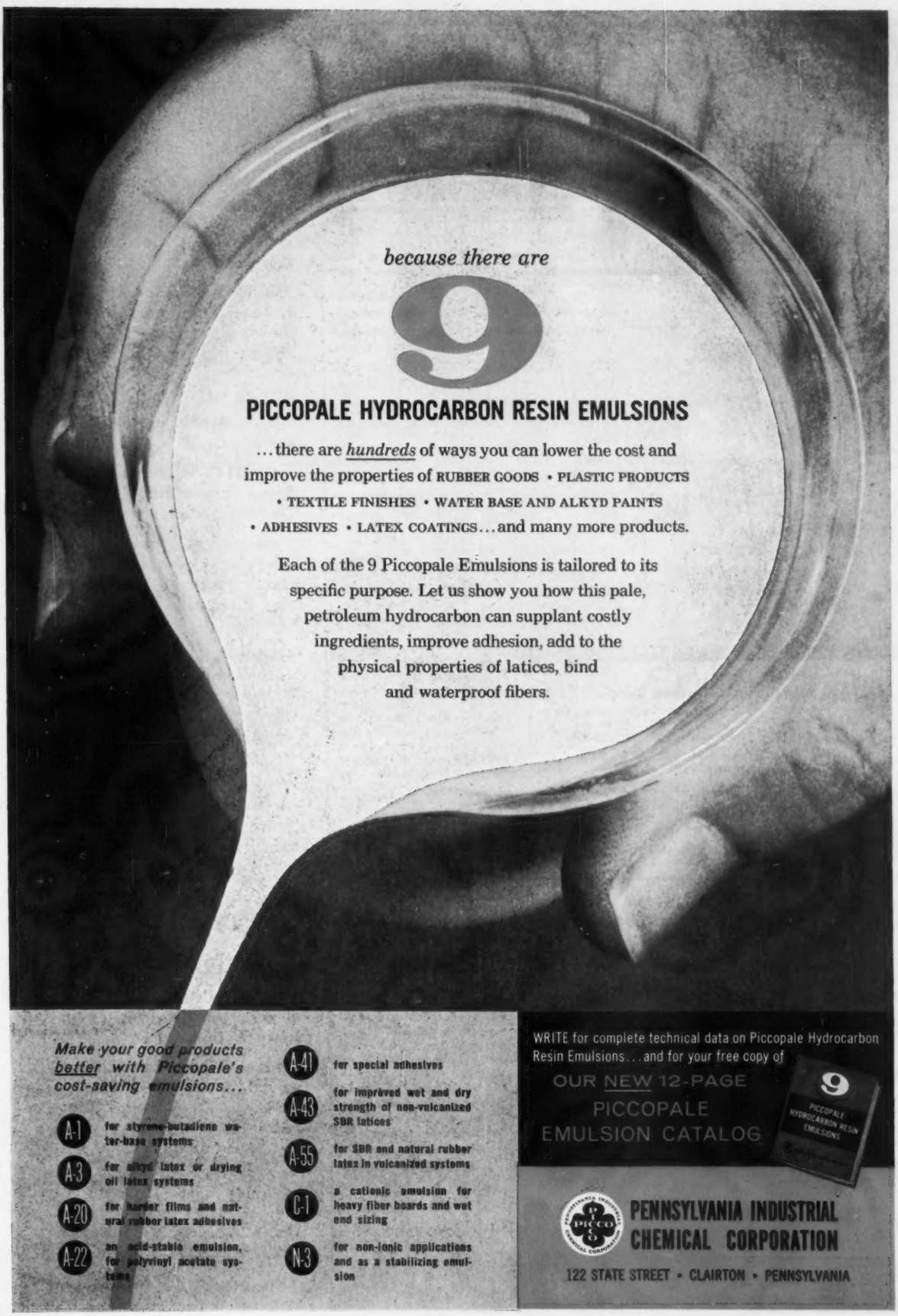
Burton F. Bowman to president, Cyanamid of Canada. (Montreal).

William A. Meiter to vice-president, Washington services, Worthington Corp. (Harrison, N.J.).

Felix N. Williams to board of directors, Plax Corp. (Hartford, Conn.).

Carl A. Odening to administrative assistant to the president, National Carbon Co. (New York), division of Union Carbide Corp.

Mark Shepherd, Jr., to executive vice-president, **S. T. Harris** to senior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vice-president for corporate development, **C. J. Thomsen** to senior vice-president for financial activities and corporate communications, Texas Instruments, Inc. (Dallas).

Robert B. Newman to vice-president, director of sales, Vulcan Containers, Inc. (Bellwood, Ill.), subsidiary of Vulcan-Associated Container Companies, Inc.

G. F. Dressel to president, **Douglas E. Lake** to vice-president and member of the board and general manager, **William R. Perdue, Jr.** to vice-president, Ethyl-Dow Chemical Co. (Midland, Mich.).

J. T. Braxtan to secretary, Bemis Bro. Bag Co. (St. Louis).

Harold H. Webber to consumer relations vice-president, Lever Brothers Co. (New York).

Campbell W. Finley to assistant to vice-president for research and product development, The Dobeckmun Co. (Cleveland), division of Dow Chemical Co.

Michael F. Schaible to president and chief executive officer, **Robert L. Fielding** to vice-chairman of the board, **Alfred F. Duemler, Jr.,** to vice-president and treasurer, Commercial Filters Corp. (Melrose, Mass.).

Sumner B. Young to member of the board of directors, **William R. Pearce** to assistant vice-president, Cargill, Inc. (Minneapolis).

James G. Duggan to secretary and treasurer, Fansteel Metallurgical Corp. (North Chicago, Ill.).

Irving Mills to vice-president, Cenco Instruments Corp. (Chicago).

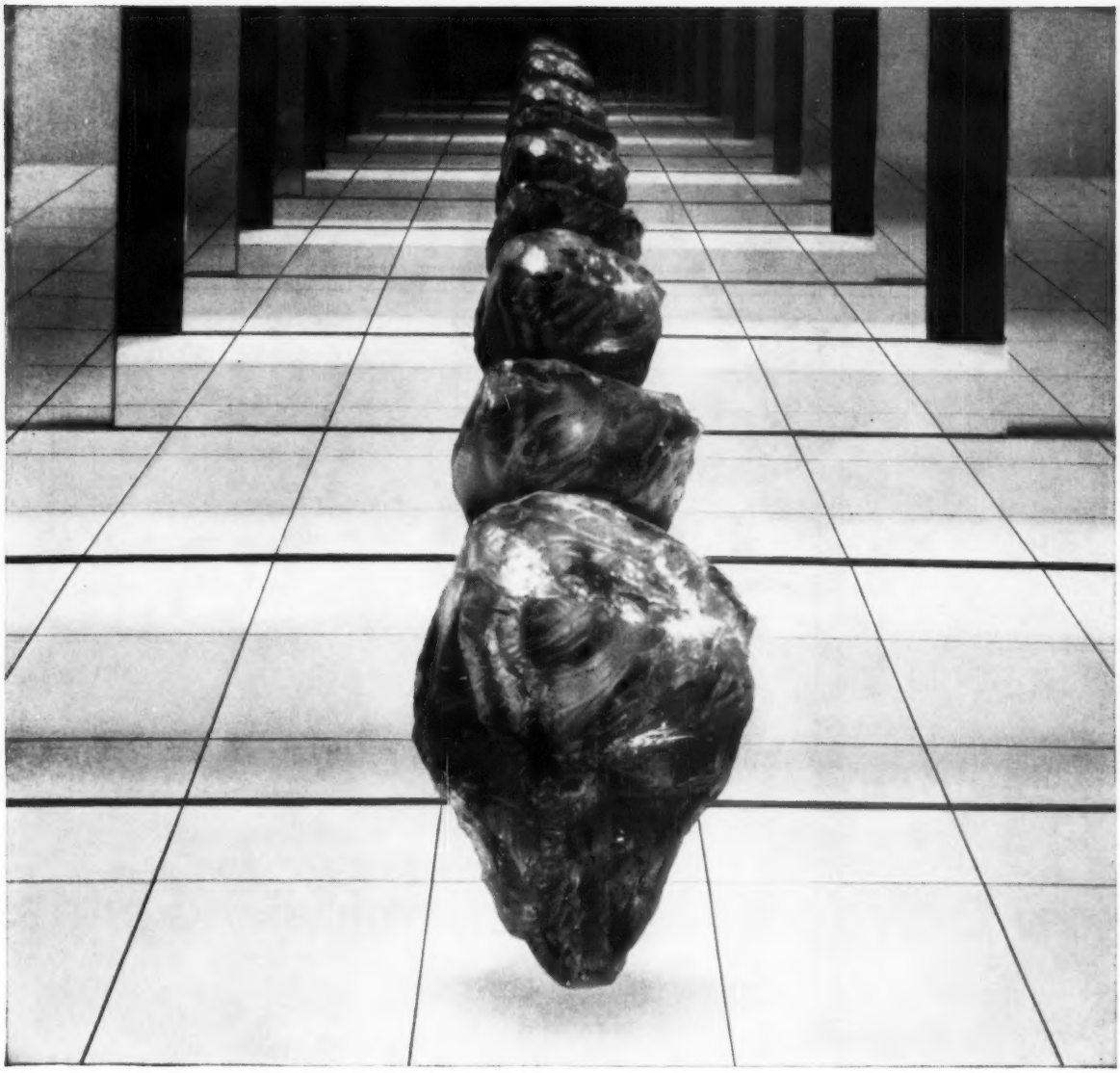
R. E. E. Costello and **C. H. Rosier** to vice-presidents, Abitibi Power and Paper Co. (Toronto, Ont.).

James P. Anderson to chairman of the board, **George F. Plummer** to president, Dunlop Canada, Ltd. (Toronto, Ont.).

J. St. Clair Moffat to president, Purdue Frederick Co. (Toronto, Ont.), ethical drug manufacturer.

E. C. Connelly to president, Pembina Pipe Line, Ltd. (Calgary, Alta.).

Frederick G. Butler to comptroller, McKesson & Robbins, Inc.



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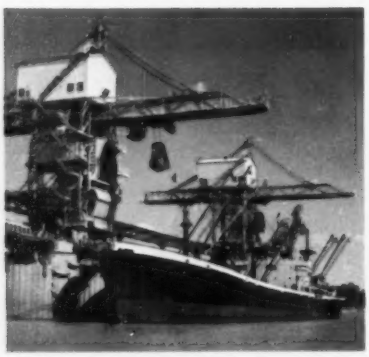
MATERIALS HANDLING

New 800-ft. multi-purpose dock and twin unloaders service both ships and barges at a 2,000 ton-per-hour rate. Check coupon at right for information on Dravo's bulk material handling equipment and economical cellular docks.

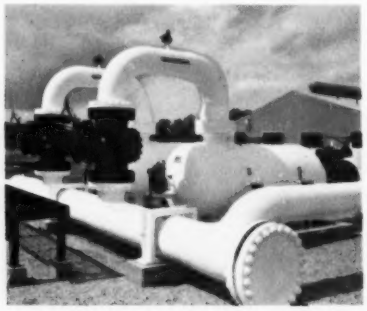


GENERATING STATIONS

In addition to large conventional and nuclear generating stations for public utilities, Dravo has built numerous smaller scale stations for industrial plants. Intakes and foundations for such installations are also Dravo specialties, as well as fabrication and erection of station piping, including nuclear applications. Mail coupon for more details.

CONSTRUCTION

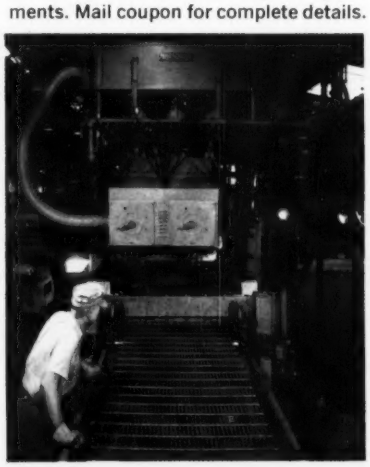
This compressor station is one of many contracts performed on a turn-key basis. Process, air separation and boiler plants, slopes, shafts, water pumping and treating facilities are part of Dravo's specialized experience. Mail coupon at right for more information.



High pressure piping being removed from heat treating furnace in Dravo's modern pipe fabrication plant.

GRATING

Tru-Weld steel grating for floors and stairways is produced in one of the nation's most modern facilities. Aluminum grating can be furnished where weight or atmospheric conditions require. Engineering, design and layout services are available for installation requirements. Mail coupon for complete details.



TOWBOATS AND BARGES

New high speed 3200-hp towboats, operating in petroleum trade, typify the variety of marine units produced yearly. Dravo has launched more than 4,000 towboats, barges, tugs, dump scows, derrick boats, dry docks, other marine units. Mail the coupon for information.

Dravo Corporation, 4761 Grand Avenue, Pittsburgh 25, Pa.

Please send me information on the following products and services

☐ Sinter & Pelletizing Plants	☐ Foundations	☐ Fabricated Piping
☐ Pumping Stations & Intakes	☐ Grating	☐ Container Cranes
☐ Sewage & Water Treatment	☐ Space Heaters	☐ Pelletizing Discs
☐ Coal & Ore Unloaders	☐ Shafts, Slopes	☐ Process Machinery
☐ Compressor Stations	☐ Oxygen Plants	☐ Steam Plants
☐ River Transportation	☐ Docks, Harbors	☐ Towboats & Barges

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

DRAVO

HOW *HERCULES* HELPS...

BRIGHTEN SUMMER DAYS—Pesky bugs at the shore or in the mountains can turn lovely vacation days into dismal memories. But not when you use products containing Metadelphene®, Hercules diethyltoluamide. It's been proven the best, longest lasting insect repellent known. Amazing Tanfastic IR-9, for example, contains Metadelphene to chase insects away while you tan fast and safely. Another Hercules product in this picture is Hi-fax®, high density polyethylene, pioneered by Hercules for making handy squeeze bottles.

KEEP POOLS ATTRACTIVE—Swimming pools stay bright and attractive when they're protected with special paints containing Parlon® Hercules chlorinated natural rubber. With some 211,000 private pools in use today this is a big job—and another of the myriad ways Hercules chemicals are used to produce better performance in the products of others.

HERCULES

HERCULES POWDER COMPANY

Hercules Tower, 910 Market Street, Wilmington 99, Delaware

CHEMICAL MATERIALS FOR INDUSTRY

Technology
Newsletter

CHEMICAL WEEK
August 19, 1961

Another big liquid hydrogen plant will be needed soon. The National Aeronautics and Space Administration made an extensive study, found that liquid hydrogen requirements for the projected space program will be more than present capacity can support. Top NASA officials met last week to iron out details of a plan to spur construction of the new unit. Later this year, it will seek contract proposals from the chemical industry.

Present U.S. capacity for liquid hydrogen is better than 53 tons/day. Operators, locations and capacities in tons/day: Air Products and Chemicals, West Palm Beach, Fla., 30 and 13 (two units), Painesville, O., 2; Linde, Torrance, Calif. 6; Stearns-Roger, Bakersfield, Calif., 2. In addition, Linde is building a 26-tons/day plant in Ontario, Calif.

Actually, U.S. capacity is probably higher than nominal ratings indicate. Air Products' big Florida plant (Papa Bear) can probably make 35 tons/day when pressed. And Linde's new plant will probably make 30 without difficulty.

•

Polyesters for tire cord received a boost last week as Goodyear reported it had solved the adhesion problem. It uses a two-dip system, the first to bond the fiber, the second, a high-temperature (450-500 F) dip to bond the rubber. Key to the method is an undisclosed chemical withheld from the first dip, present in the second "in abundance". The technique is still considered experimental but Ted M. Kersker, manager of fabric and adhesives development for the company, reports considerable field testing under way.

The incentive for polyesters in tire application is that it would combine the good points of nylon (strength) and rayon (relatively little thumping caused by "flat spots"). Mostly, however, it would give the tire manufacturer a premium feature, a point that has been lost since nylon cords became available in cheaper tires.

Others have been working on the adhesion problem. Canadian Industries Ltd. (Montreal), for example, reported work it has done on a two-stage system using an acqueous emulsion. The first stage employs a polyvinyl chloride-polyamide-dioctyl phthalate emulsion.

Goodyear feels that commercial production of tires employing polyester cords may be less than a year away. In fact, it is already looking at polyolefins as the successors to polyesters. These, however, are probably 10 years distant.

•

A brighter, longer-lasting incandescent lamp has been developed jointly by Polaroid and Union Carbide. In a program at the 18th International Congress of Pure and Applied Chemistry at Montreal, researchers revealed that a lamp using tantalum carbide as the filament (instead of tungsten) gives 25% more brilliance, lasts from 50-100% longer. The

Lighting Products Division of Sylvania has been working with Polaroid in making prototype production models but Polaroid officials say no plans for commercial production have been formulated.

The features of the new lamp stem from tantalum carbide's higher melting point. Trouble was encountered in its instability in the inert (nitrogen-argon) atmospheres in the lamp. Researchers solved this by employing a hydrocarbon-hydrogen atmosphere. But the high heat conductivity of the mixture caused loss of power. They circumvented this by using hydrogen and substituting halogen acids, particularly chloride and bromide.

The first application for the lamps would probably be in projectors, but automotive headlights, flashlight bulbs and stadium lights are also possibilities.

•

Watch for word of a new soap bacteriostat. Made by Olin-Mathieson. It's believed being groomed for use in a new Procter & Gamble offering. The chemical nature of the material is not known. But it's probably a thiopyridine company. (Some time back, O-M reportedly approached soapers with 2-thio-1-pyridine oxide.)

Presently, hexachlorophene and TCC (trichlorocarbanilide) are kingpins in the field. But the soap companies are always looking for something less expensive. Dial reportedly uses 0.5% TCC and 0.5 hexachlorophene; Zest reportedly empolys 2% TCC. TCC sells for $2.00/lb. in lots of 2,000 lbs. and over; hexachlorophene for $1.48 in drum quantities.

Also, current bacteriostats are effective against gram-positive bacteria, which are common on the skin. One that would be effective against gram-negative bacteria as well might give the soaper an added selling point.

•

Shipping iron ore by pipeline? Premier Steel Mills Ltd. of Edmonton has discussed with the Alberta and National Research Councils a 400-mile line to move refined ore from Alberta's Peace River district to the Canadian West Coast. Consensus: the project is feasible. It would use a 6 in. line with water as the carrier. It would cost $15 million and be capable of moving 1 million tons of concentrate.

•

A new "teaching machine" made its bow this week. It's called Audio Graphic, is made by Graflex, Inc. (Rochester, N.Y.). Here's how it works: the user takes motion pictures of the job, records the instructions and projects slides on the "Instructor," a desk-size unit complete with a small (8x10 in.) screen, amplifier and necessary equipment. The operator can receive audio instruction through built-in speaker, or earphones.

The device is aimed primarly at teaching repetitive jobs in the military, in assembly lines and similar jobs. But there's considerable interest in the idea on the part of the chemical companies. One large chemical firm is known to be working on its own machine.

CHEMICALS OUTLOOK

August, 1961

This bulletin is published to keep you posted on Wyandotte key chemicals, their applications, and the many services Wyandotte offers. You may want to route this to interested members of your organization. Additional information and trial quantities of Wyandotte key chemicals are available upon request . . . may we serve you?

PLURONIC POLYOLS AS RINSE AIDS

Although rinse aids have been used for some time in commercial dishwashing operations, it hasn't been until the past few years that their use has gained significant prominence in the home. Now, with every passing year, more and more home dishwashing machines are being equipped with rinse-aid injection devices. These, of course, call for adequate rinse aids.

Only small quantities of the Pluronic® polyols are required to make excellent rinse aids when injected into the final rinse during dishwashing operations. Since they are by nature low foaming, practically no foam is generated in the spray cycle, providing a more complete rinse. This plus their excellent wetting properties enable dishes, glasses, silverware and plastics to drain rapidly and air-dry without spotting and without hand-toweling.

Sparkling surfaces result from the use of Pluronic polyols . . . their surface activity causing the rinse water to sheet off uniformly eliminating tell-tale drying lines. Pluronic grades containing approximately 20% to 30% hydrophilic content are sufficiently soluble at use temperatures to prevent spotting and localized surfactant agglomeration. Being nonionics, they are not affected by the common salts found in hard water.

All Wyandotte's Pluronic grades exhibit excellent lime-soap dispersion qualities. Moreover, certain Pluronic polyols can be used in solid-type rinse aids. For more information and our new data sheet write us on your company letterhead. Be sure to address Dept. CO for prompt attention.

NEW $3.5 MILLION PROPYLENE OXIDE PLANT

Wyandotte's board of directors approved final plans for a new propylene oxide plant to meet the growing demands of the detergent and urethane markets. Construction will begin shortly on 23 acres of waterfront property at Wyandotte, Michigan.

WYANDOTTE CHEMICALS

WYANDOTTE CHEMICALS CORPORATION

WYANDOTTE, MICHIGAN • OFFICES IN PRINCIPAL CITIES

SODA ASH • CAUSTIC SODA • BICARBONATE OF SODA • CALCIUM CARBONATE • CALCIUM CHLORIDE • CHLORINE • GLYCOLS • SODIUM CMC • ETHYLENE OXIDE ETHYLENE DICHLORIDE • POLYETHYLENE GLYCOLS • PROPYLENE OXIDE • PROPYLENE DICHLORIDE • POLYPROPYLENE GLYCOLS • SURFACE-ACTIVE AGENTS DICHLORODIMETHYLHYDANTOIN • CHLORINATED SOLVENTS • URETHANE FOAM INTERMEDIATES • DRY ICE • OTHER ORGANIC AND INORGANIC CHEMICALS

Nopco puts water to work for industry

Almost any water will do—*after suitable modification.* Modern industrial processes such as wiredrawing, papermaking, fabric dyeing and finishing, leather tanning, paint mixing require water that is treated with surfactants supplied by firms such as Nopco. Water that emulsifies with oils, for example. Water that can be beaten into a pulp without foaming. Water that carries dyes and penetrates deep into fabrics. Water that carries latex paints in proper dispersion. Nopco knows water and surfactants, too. Consult us for the best ways to make both work harder in your industrial process.

For more complete information, see Chemical Materials Catalog

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Emulsifiers
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A SKILLED HAND IN CHEMISTRY . . . AT WORK FOR YOU

West German chemical plants work round-the-clock to meet demand, hit new production records in '60.

Summing Up Germany's Chemical Boom

U.S. producers can now take a detailed look at the trends that brought on West Germany's '60 chemical industry boom. A newly available U.S. government report* shows production and trade figures for the major chemical groups and for many specific commodities, and discusses the factors behind the important trends.

With production up 14.6%, and sales—tarnished a bit by some weak prices—rising 12% above the '59 levels, Germany's chemical boom was pretty much across-the-board. Gains were made in all industry sectors. Sales, production, exports, imports and investment, all scored record highs. Germany easily held its place as the world's fourth-largest producer.

The main thrust behind this growth shows up in the industrial organic chemical sector, where output shot up almost 20%, reflecting the heady growth of petrochemicals (up 85%), plastics (up 24%) and noncellulosic synthetic fibers (up 36.2%).

Petroleum and gas continued to edge up on coke-oven and gas-plant by-products as a source of raw materials. The proportion of primary chemicals based on petroleum and natural gas that were used in organic synthesis rose from 40% in '59 to 44% in '60.

Nevertheless, increased coal mine operations enabled producers to push up output of primary chemical by-products 5%, and they could have sold much more of their products if they could have boosted production further. Although benzene output increased 77% and was supplemented by a 35% gain in imports of benzol products, heavy demand jacked up prices—in some cases to double the '59 levels. Naphthalene was also short.

Plastics Push: Despite a gradual easing in the second half of the year (it has continued this year), production and sales of plastics rose more sharply than those of any other chemical group. The zip came in domestic consumption, up 28%, to about $643 million. Exports were up too, a sizable 19.1% in value.

As a group, polymerization products were the fastest-growing plastics, accounted for 49.9% of total output, compared with 48% in '59. Polyvinyl chloride scored one of the most solid gains, bolstered by its increasing use in piping and packaging.

Polyolefins showed the steepest gains again in '60, but they were far less impressive than in '59. And price cuts, accompanying a domestic capacity increase that outstripped demand, plus availability of cut-price imports, took a big bite out of revenues.

The one group of plastics to get a boost from exports was the cellulose derivatives. While their output was up only 11.3%, exports rose about 22% both in volume and value. In contrast, exports of polymerization products gained at a slower rate than output, in volume and especially in value. Polymer exports, however, accounted for almost two-thirds of Germany's raw-plastics sales abroad, and one-third of its total polymerization output.

Fiber Standout: In the synthetic fiber group the noncellulosics continued their gains over the older fibers. In '60 they raised their share of total man-made fiber production to 18.6%, and accounted for an estimated 45%

* Foreign service dispatch 358, available on loan from Trade Development Division, Bureau of Foreign Commerce, Washington, D.C.

West German Chemical Industry—Boom Grew in '60

(Monetary conversion rate: 1 DM=$0.238)

Sales $5.4 billion*	up 12.7%	Prices	down 0.5%
Production	up 14.6%	Productivity	up 10.7%
Exports $1.5 billion	up 13.6%	Labor costs	up 9.7%
Imports $660.7 million	up 32%	investment $476 million	up 17.6%
Employment 458,000	up 6%		

* Excludes $40.7 million for Saar.

of sales. West Germany probably went ahead of Britain in fiber output, and into third place among world synthetic fiber makers.

Polyamides staged something of a comeback in '60. They seemed to be losing ground to the acrylics and polyesters in '59. But last year the development of new uses—e.g., in coated fabrics for tarpaulins and in household textiles — helped the polyamides hold their share in the booming fiber market.

The polyesters (e.g., Hoechst's Trevira and Glanzstoff's Diolen) racked up the biggest gains in the fiber group. Output almost doubled, now accounts for one-third of noncellulosic synthetic fiber production.

Acrylics growth, meanwhile, had come to a standstill by the end of the year, partly because of its price disadvantage against wool.

Imports Up: Germany's chemical boom was good news to foreign suppliers too. They boosted shipments to Germany 32%. Imports from the U.S. jumped 39.7%, to $197.5 million. The biggest gains were in tar dyes (up 205.1% to $946,288), noncellulosic and cellulosic synthetic staple (up 114.2%, to $4.8 million), tar products (up 76.9%, to $14 million), and industrial chemicals (up 61.2%, to $54.3 million). Plastics imports from the U.S. were up 12.6%, to $25.5 million.

Cost-Price Squeeze: But German producers had problems along with their bouncy sales records. Over-all, prices of their products were down 0.5%. The decline was most marked in organic industrial chemicals — the price index dropped 1.6%. It was off 0.6% for inorganic industrial chemicals, although it held steady for specialty chemicals. Petrochemicals had the worst decline. Nitrogenous fertilizers, pesticides, and some pharmaceuticals also showed price declines. And the trend was expected to continue this year.

At the same time, production costs continued to rise. Unlike the '59 pattern, when overhead was dropping, prices of raw materials, fuel, etc., held steady or even increased. The price index for investment goods industries moved up 1.3%. Petroleum, machinery construction and freight rates all were more expensive.

The labor shortage, meanwhile, is termed the industry's No. 1 problem;

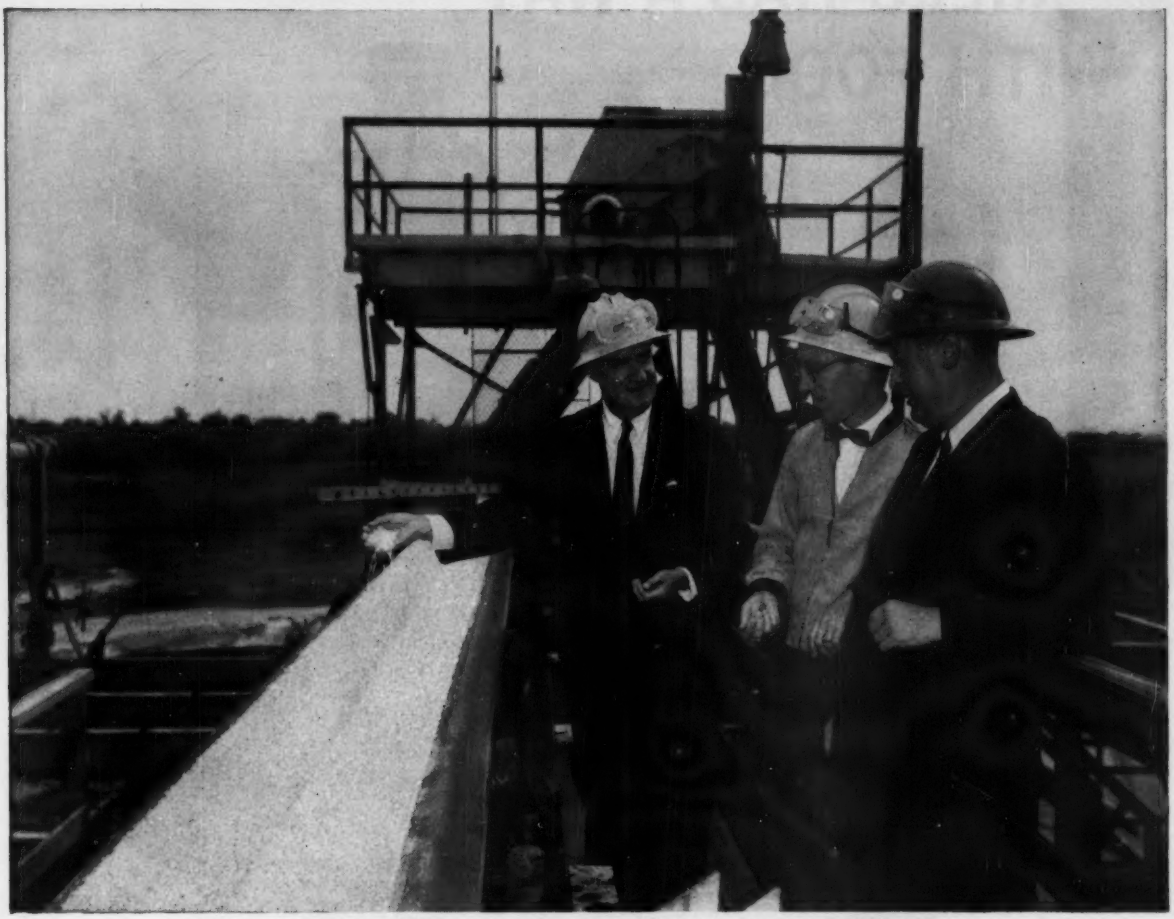
Pinpointing West German Production Gains

(metric tons, unless otherwise noted)

	Percent Change from '58	*'60 Output*	*Percent Change from '59*
Inorganic Industrial Chemicals	Up 6.5		Up 11.4
Sulfuric acid	Up 0.7	2,588,000	Up 7.9
Synthetic ammonia (primary nitrogen)	Down 2.5	1,242,166	Up 13.6
Calcium carbide	Up 3.8	1,101,107	Up 6.3
Soda (Na_2CO_3)	Up 10.8	1,117,162	Up 11.8
Chlorine (primary output)	Up 10.0	657,801	Up 11.1
Caustic soda, soda-lye	Up 10.1	775,964	Up 10.9
Organic Industrial Chemicals[1]	Up 6.8		Up 19.9
Coke-oven and gas plant by-products:			
Ammonia	Down 7.4	112,000 N	Up 12.0
Naphthalene, hot pressed	Up 20.0	108,500	Up 9.0
Naphthalene, pure	Up 9.0	19,700	Up 82.4
Phenol[2]	Up 17.0	15,950	Up 4.0
Cresol, cresylic acid	Up 24.0	24,700	Down 3.9
Benzol distillates	Down 8.9	652,400	Up 25.6
Motor benzol	Down 13.3	170,300	Down 39.4
Petrochemicals (carbon content)	Up 47	620,000	Up 85.0
Methanol, raw	Up 18.5	332,996	Up 12.3
Methanol, pure	Up 13.9	261,410	Up 8.9
Butanol	Up 10.1	75,079	Up 16.0
Gycerin, pure	Down 11.7	6,823	Up 25.7
Glycerin, dynamite	Down 6.5	7,147	Up 11.3
Ethyl ether	Up 25.7	3,056	Up 14.1
Ethylene oxide	Up 43.0	79,211	Up 34.8
Formaldehyde	Up 21.4	152,721	Up 21.6
Acetaldehyde	Up 1.9	244,252	Up 8.8
Acetic acid (primary output)	Up 6.8	109,447	Up 8.9
Acetic anhydride	Up 14.2	31,538	Up 18.6
Formic acid	Up 24.8	17,396	Down 23.0
Triethanolamine	Up 10.4	4,194	Up 33.1
Vinyl monomer compounds	Up 42.9	387,761	Up 34.1
Plastics, raw	Up 28	982,000	Up 24
Polyvinyl chloride	Up 22.7	172,673	Up 31.8
Polystyrene, polyvinyl acetate[3]	Up 28.7	142,350	Up 29.8
Polyacrylate, polymethacrylate	Up 32.2	33,505	Up 23.1
Polyolefins	Up 92.4	80,766	Up 32.2
Other vinyl derivatives	Up 42.8	23,795	Up 40.0
Copolymers, exc. rubber	Up 79.7	34,612	Up 32.2
Phenolic plastics[5]	Up 12.8	32,779	Up 8.9
Urea and melamine plastics[5]	Up 23.1	11,855	Up 6.9
Phenol, urea, melamine for glue	Up 22.7	121,401	Up 19.5
Modified lacquer resins	Up 23.7	59,263	Up 15.6
Phenolic molding compositions	Up 3.7	44,503	Up 12.7
Urea molding compositions	Down 2.2	8,571	Up 18.2
Polyamides, linear urethanes	Up 32.3	10,205	Up 25.4
Cellulose acetate	Up 15.8	24,421	Up 10.3
Nitrocellulose	Up 14.8	18,574	Up 6.8
Other cellulose derivatives	Up 19.8	60,743	Up 13.8
Synthetic fibers	Up 15	281,800	Up 7.6
Cellulosic	Up 9.9	229,500	Up 2.6
Noncellulosic	Up 57.4	52,300	Up 36.2
Fertilizers[4]			
Nitrogen (N content)	Up 0.3	1,051,000	Up 0.09
Phosphate (P_2O_5 content)	Up 6.7	814,000	Up 21.2
Potash (K_2O content)	Up 4.6	1,908,400	Up 12.4
Paints and Varnishes	Up 12.7	497,741	Up 9.9
Dyestuffs, mineral and tar		$374.6 million	Up 15
Pharmaceuticals	Up 9.8	$555.3 million	Up 14.9
Soaps, washing, cleansing agents	Up 7.0	525,888	Up 3.0
Cosmetics	Up 18.1	$150.3 million	Up 13.7

1. 1960 figures include Saar; 2. From coal tar and cokery waste water; 3. Ratio of polystyrene to polyvinyl acetate production estimated at 2:1; 4. Fertilizer year; 5. Not molding, glue resins.

BEHIND THE MAN FROM DIAMOND CRYSTAL...
the chemical salt "know how" of Whit Lonsdale!



Whit Lonsdale, Vice President and chemical salt specialist of the Diamond Crystal Salt Company, looks over a shipment of salt with Chester D. Jones, Director Purchasing for Diamond Alkali, and Maurice Sullenden (center), General Manager of Diamond Alkali's Muscle Shoals plant.

Most important to chemical salt users:—Get the grade of salt they want, in the vast amounts they need, at the lowest possible delivered cost. Salt specialists like Whit Lonsdale, have the experience, the ability, the handling "know how" to combine all these necessary elements into a single package to provide famous "Diamond Crystal Salt Service."

Here at Diamond Alkali's big Muscle Shoals, Alabama plant, highest quality chlorine and rayon grade caustic soda are produced by the modern deNora Mercury Cell process. This calls for a low moisture, fast dissolving salt that saturates completely without channeling. Diamond Crystal supplies this salt in quantity, in a manner that permits Diamond Alkali to operate at peak efficiency. That's what makes Diamond Crystal a leader in salt production for the chemical industry—that's why you should know the Diamond Crystal Salt service story. To get it, call or write—

Diamond Crystal Salt Company

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From beefsteak to biscuits . . .

MILES HAS A WAY WITH FOOD

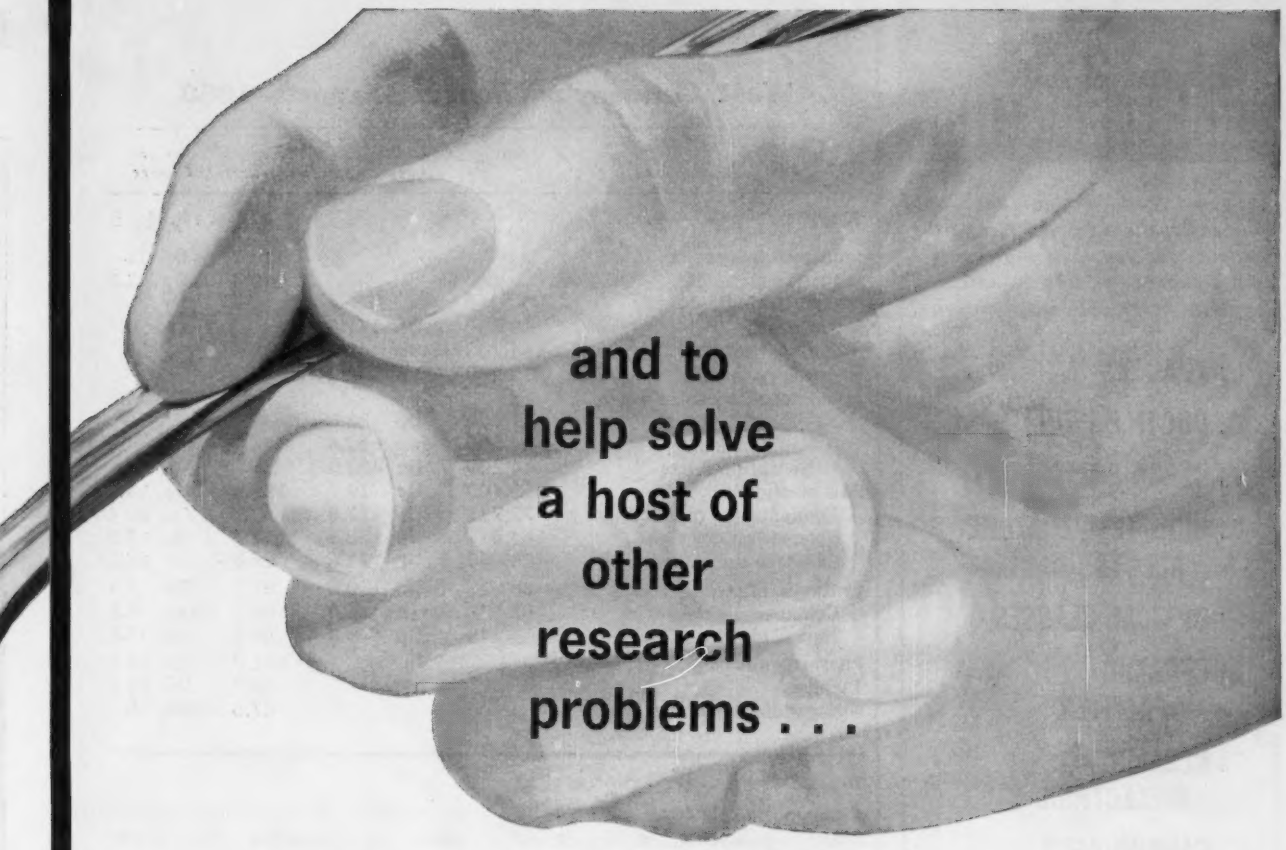
to prolong shelf life, protect color, tenderize, adjust pH, speed processing!

WITH HIGH-PURITY CITRIC ACID, produced by Miles' unique deep-fermentation process, you multiply the benefits of this versatile ingredient. And Miles is an experienced large-volume producer, producing quantities that assure you of a steady supply . . . a midwestern source with over 70 warehouses located strategically, stocked abundantly.

WITH ANTIOXIDANTS, where accurate formulation is important to you from the standpoints of economy and product quality, Miles is making important contributions. **CONSIDER TAKATABS,** for example. Here is sodium erythorbate (isoascorbate) in convenient tablet form — accurately premeasured units. Waste and spillage are virtually eliminated, and the possibility of "human error" in the plant is greatly reduced. For the small-quantity user, Takatabs cost less in the long run.

WITH A WIDE CHOICE OF ENZYMES, Miles is not limited to a few products from which to choose the proper enzyme to do *your specific job.* Selecting from the widest range of commercial enzymes available — manufactured by its famous Takamine plant — Miles' sales and technical service personnel can pick the enzyme to meet your requirements accurately, objectively and economically — not just "come close."

Get the additional information you need about the products Miles makes for the food industry. Write: Miles Chemical Company, Division of Miles Laboratories, Inc., Elkhart, Indiana, Congress 4-3111.



MILES HAS A HAND IN THINGS TO COME

MAKING PAPER STRONGER... OR MAKING IT DISAPPEAR — Two research groups at Miles, working virtually side-by-side, have worked out an apparent paradox on paper. One group has developed a dialdehyde starch — SUMSTAR® — that imparts such amazing wet and dry strength you have to see it demonstrated to believe it. The other group, through proper selection of strain and fermentation medium, has produced a highly potent enzyme — TAKAMINE CELLULASE 4000 — that depolymerizes cellulose substrate... and makes paper disappear. It can be controlled, too, to modify the surface of industrial cellulose products without materially altering the strength.

GETTING THE MOST OUT OF PROTEIN — Nature's formula for lactic acid is a pretty good one. Duplicating it is, for many, a desirable goal; for Miles, it is an accomplished fact. Miles lactic acid, predominantly dextrorotatory (L+) isomer, is expected to minimize undesirable flavors and improve protein utilization of foods and feed products... to find new applications in medical ointments and creams... and to provide a possible use in the synthesis of polyester resins.

OUR FAMILY OF AMINES — Seems like every time we introduce our family of aralkyl (benzyl) amines, we have to add another name or two. Biggest reason for this is that we often create new amines where existing ones cannot solve the problem. Never can tell... maybe one of them can solve a sticky problem for you. Or maybe we can add another member to our family. All we need to get started is a description of your problem.

BUILD YOU A MOLECULE? As a matter of fact, we're equipped with the facilities and people to help you *solve a wide variety of problems* in the field of fine organics. We keep some 18 unit processes razor-sharp and ready to cut king-size problems down to size. And sometimes custom work turns out to be a good investment. Let's get together and talk about it.

MILES CHEMICAL COMPANY

DIVISION OF MILES LABORATORIES, INC., ELKHART, INDIANA • CONGRESS 4-3111

MF-1-1

West Germany's Chemical Exports—1960

	Tons	Percent Change	Value (million dollars)	Percent Change
Total			1,474	Up 13.6
Industrial inorganics			115.7	Up 16
Industrial organics			270.4	Up 11.5
Coal by-products				
Coal tar	19,500	Up 171.6		
Coal-tar pitch	144,700	Up 48.2		
Heavy tar oils	39,300	Up 122.2		
Phenol, cresol, cresylic acid	31,100	Up 33.3		
Naphthalene	34,500	Down 12.4		
Benzol products	4,200	Up 420.0		
Raw plastics	266,460	Up 19.7	199.4	Up 19.1
Condensation products	72,721	Up 17.8	57.7	Up 20.4
Polymerization	164,417	Up 20.3	112.4	Up 17.8
Cellulose derivatives	26,080	Up 21.6	25.8	Up 22.1
Synthetic fiber	80,027	Down 0.8	87.5	Up 7.9
Cellulosic	68,678	Down 5.4	50.4	Down 7.9
Noncellulosic	11,349	Up 40.9	39.8	Up 37.5
Pharmaceuticals			141.8	Up 19.4
Tar dyes			108.3	Up 16.5
Nitrogenous fertilizers			67.6	Down 16

although it hadn't yet directly crimped production in '60, it did cause some bottlenecks in supply industries. Wages, salaries and other labor costs in the chemical industry were forced up, and productivity gains failed to keep pace. And the squeeze was expected to tighten.

Outlook Promising: Summing up the views of German business forecasters, the U.S. government's report notes that West Germany's "'economic miracle' is over, but the boom is not." While industrial expansion may slow in the current year, the evidence still points to continuing growth. And the chemical industry will likely follow the over-all pattern.

Chemicals going into industry are expected to grow fastest; consumer specialties will probably maintain last year's moderate growth. Industrial inorganics will continue rising, but more slowly than in '60, while organics maintain their rapid pace.

With prices under continuing pressure, the year's sales gain will probably slip to 10%. Imports are expected to hit record levels again.

Export growth may slow, in light of such pressures as the Deutsche mark revaluation, higher costs, lower tariffs, and intensified international competition.

German producers had been concerned about the tariff cuts scheduled within the European Free Trade Assn., which would have given Great Britain, Germany's biggest European competitor, an advantage within the EFTA area. But Britain has now decided to try to join the Common Market and take along some EFTA members. This may not be worked out for a year or more, but in the interval it isn't likely that the trade blocs will let the split widen.

Looking further ahead, the report cites a study that estimates 100% production gains for noncellulosic fibers over the next decade and 150% advances for resins and plastics, resulting in an increase of 225% for organic chemicals and 40% for inorganics.

These assumptions, states the report, seem "reasonable and even modest," in light of the German industry's past performance. It cites two factors that should work toward boosting these projected gains: (1) development of the Common Market, or a larger free-trade area; (2) the activities of the "Big Three" producers, the I. G. Farben successors.* Development of free trade should put to use Germany's relative advantages in fields such as the chemical industry.

* Farbenfabriken Bayer, Farbwerke Hoechst, and Badische Anilin- & Soda-Fabrik.

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Market Newsletter

CHEMICAL WEEK
August 19, 1961

Bulk price of helium will be doubled within the next three months by the U.S. Bureau of Mines—to pay for the big $47.5-million/year government purchase program authorized by Congress (*CW Market Newsletter, Aug. 12*). This means that the current bulk price of $19/1,000 cu. ft. (f.o.b. plant) now charged nongovernment customers will jump into the $35-40/1,000 cu. ft. range.

Federal agencies have been paying $15.50/1,000 cu.ft.—a little more than actual cost of production. When the price hike comes, the government agencies too will be paying $35-40.

USBM says its bulk-price increase does not justify doubling of retail prices of helium. Reason: freight and high-pressure tanking costs are greater than actual cost of the gas. There is no indication yet of what will happen to retail prices. Best guess: a 3¢/cu.ft. increase to 10¢/cu.ft.

The government purchase program will store considerable amounts of helium now wasted, because it is not extracted from natural gas. Meanwhile, government production is climbing: output in '60 was 642 million cu.ft., compared with 477 million in '59.

•

Pseudocmene (1,2,4-trimethylbenzene) is now available in commercial quantities, spot priced at 11¢/lb. (f.o.b.) Baytown, Tex.) from Enjay Chemical. Potential uses include making of: trimellitic anhydride, methyl diarboxylic acids and dimethylcarboxylic acids for surface coatings, dyes, pharmaceuticals, pesticides.

Pseudocumene is the first of several higher polymethylbenzenes to be commercialized. Others being market developed: mesitylene (1,3,5-trimethylbenzene), durene (1,2,4,5-tetramethyl benzene) and meta exylene (1,3-dimethylbenzene).

•

Spencer Chemical is now marketing an ammonium nitrate blasting agent produced at just-completed facilities in Carlsbad, N. M. The nitro-carbo-nitrate (NCN-1) mixture consists mainly of nitrate, with about 6% No. 2 diesel oil added; it's priced substantially below the cost of dynamite.

The blasting material is shipped in 50 lb. bags to consumers in the Southwest—mainly for underground mining of potash ores. Other uses: seismic testing, road construction, underground uranium mining, various open pit mining operations.

Initial capacity of Spencer's plant is 20 tons/day but there is provision for expansion as demand increases. This is the first time Spencer has made the material for general sale, although the firm's affiliated mining interests have compounded the blasting agent for captive use.

Spencer believes—and the Interstate Commerce Commission concurs—that the blasting mixture qualifies for shipment under yellow label regulations.

Chlorothene (methyl chloroform) will be made at Sarnia, Ont., by Dow Chemical of Canada. The general-purpose solvent will be sold mainly for cold-cleaning in metal fabrication, printing, textiles. Canadian demands for cold-cleaning solvents (now mainly petroleum distillates) is 50-100 million lbs./year.

Trade observers doubt that Dow will be able to corner the cold-cleaning market with chlorothene, largely because of the solvent's high price—18¼¢/lb., compared with about 5¢/lb. for naphthas.

Dow is optimistic, says the price handicap can be minimized through solvent reclamation; its sales pitch will stress low toxicity, compared with that of other chlorinated solvents (e.g., perchloroethylene, trichloroethylene and carbon tetrachloride, which Dow also makes at a 15-20-million lbs./year plant at Sarnia). Capacity of the new chlorothene unit was not disclosed. Best guess: about 5 million lbs./year.

•

Continental Carbon is starting up its new, $4-million carbon black plant and laboratories at Bakersfield, Calif. Output of the 50-million-lbs./year capacity plant (oil furnace blacks) will go to the West's growing rubber, ink, paint and plastics industries; 95% of total output will be for rubber. Witco Chemical will market Continental's carbon black.

Building of the West's first carbon black unit means that there is now a nearly completely integrated tire operation in the region—including synthetic rubber production, tire manufacture, assembly of cars. Still missing: tire-cord manufacture to supply an estimated 20-million-lbs./year demand.

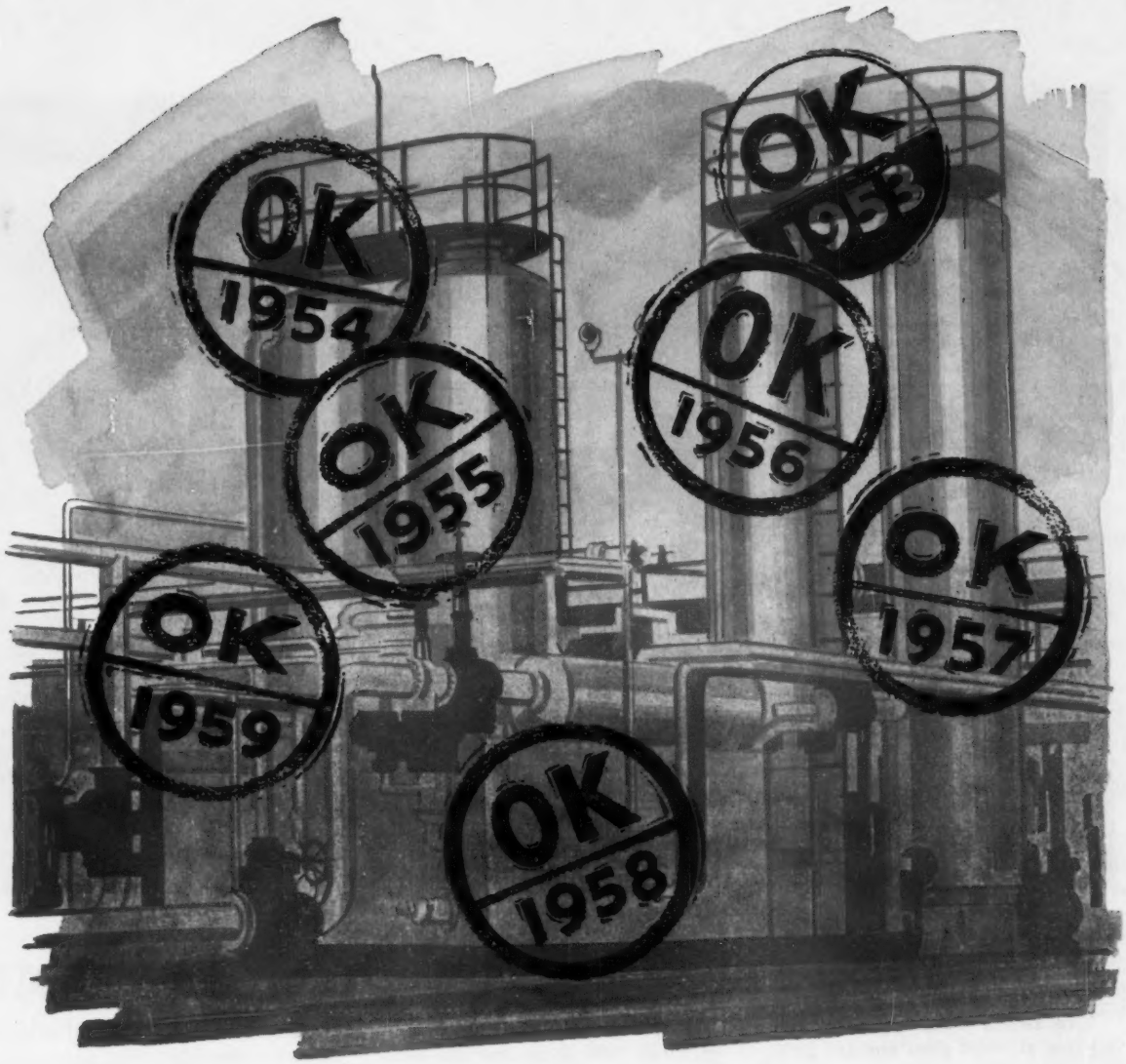
Continental won't be getting all the West Coast carbon black business. United Carbon is also building a new carbon black plant—64 million lbs./year at Mojave, Calif.—aimed at supplying the burgeoning western tire industry. The firm broke ground on a 45-acre tract last month, expects to complete the plant by December.

A United spokesman agrees that tire manufacture in the West will be booming, adds that "tire sales in Los Angeles County alone are higher than anywhere else in the country."

•

Cities Service Refining has completed its new aromatics plant at Lake Charles, La.—it consists of an 8,100-bbls./day Udex unit and a 120-million-lbs./year ortho-xylene unit, engineered and constructed by Badger Manufacturing Co.

The plant will provide Cities Service with a raffinate stream for production of low-luminosity jet fuel blending stock. Also set for production: aromatic concentrate for use as high-octane gasoline component or as charge stock for production of other eight-carbon aromatic isomers and toluene.



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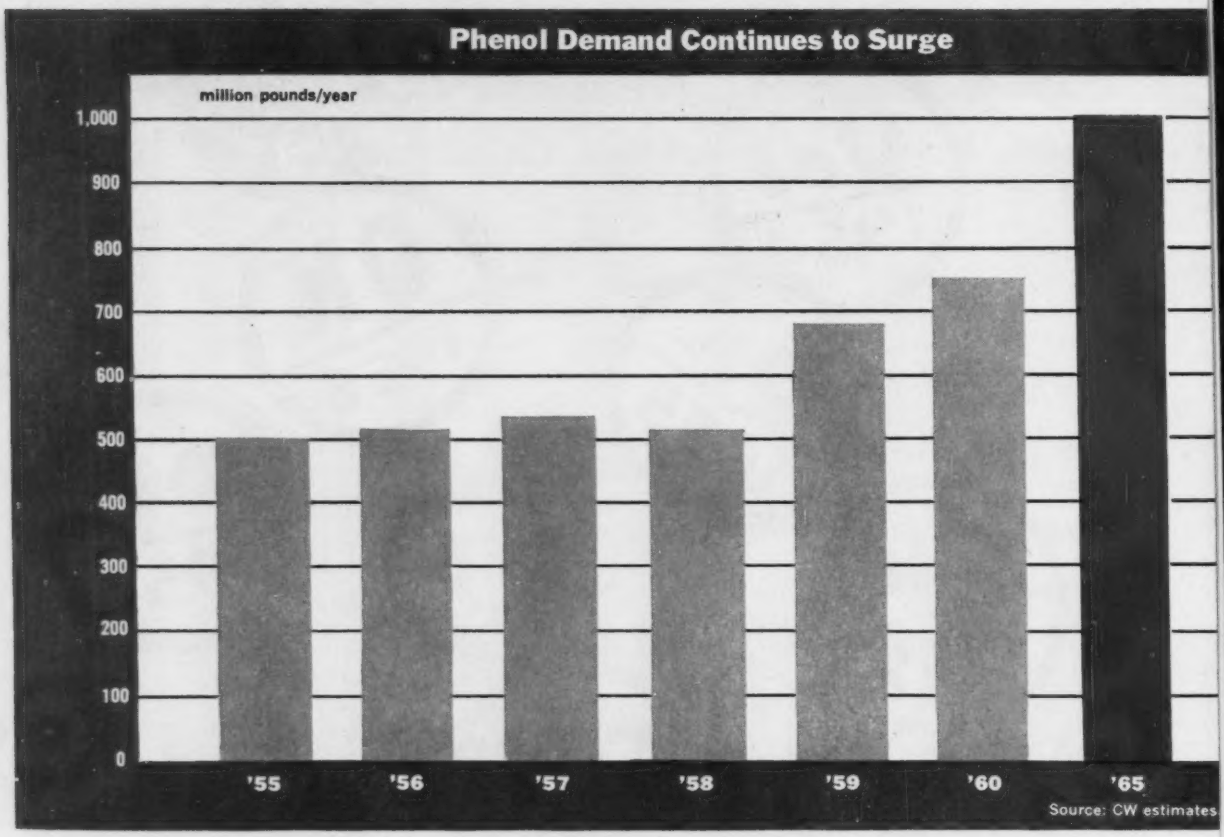

Phenol Price Slash: Demand Spur

Last month when phenolic resin tag (for plywood glue) tumbled 20%, one question was immediately raised throughout the chemical industry: Will a phenol price cut follow? The answer was not long in coming. Last week Dow Chemical Co. reduced phenol prices by ¾¢/lb. across the board, making the new tank-car price 16¼¢/lb., freight allowed. Other producers soon posted similar quotes.

In discussing the reason for the price cut, a Dow spokesman cited an imbalance in the U.S. between phenol capacity and demand that "appeared to be increasing due to expanding production." He felt that Dow's pricing move "should allow phenol end-products to compete more readily with other materials in the market and ease the impact of excessive production.

"The market condition, coupled with the recent decline in phenolic resin pricing, led to the price cut."

There's little doubt that the latter condition contributed significantly to the phenol price reduction. Since last month's price cut on phenolic resins, pressure on the price of phenol could be felt throughout the Pacific Northwest, where large volumes of phenolic resins are utilized by the plywood industry. Some of the big phenol buyers reportedly were so certain that a price cut was imminent that they were making purchases on a hand-to-mouth basis to avoid being caught with inventories of higher-priced material.

West Coast Scene: Right now, phenol demand on the West Coast is estimated at 65 million lbs./year, with the major chunk, 50 million lbs., going into plywood adhesives. An anticipated increase in plywood production by '65, resulting in greater use of phenolics, is expected to more than double West Coast phenol demand.

Demand in that area could be even larger if chemical plants continue to spring up in the West and new phenol-consuming industries locate there.

Although Western phenol demand will grow, the possibility of severe overcapacity there remains. Capacity is now about 90 million lbs./year. By first-quarter '62 it will have climbed to more than 125 million lbs./year — after Dow brings its new plant on-stream at Kalama, Wash.

And more capacity may be on the way. Allied Chemical, for example, reports that it is "studying the feasibility" of a West Coast phenol plant, perhaps at Coos Bay, Ore., where Georgia-Pacific has a big plywood plant. A marketing arrangement between the two firms is said to be in the discussion stage. G-P represents an estimated 10-million-lbs./year phenol market, based on its resin needs.

Douglas fir veneers coated with phenolic resin binder move into hot press, underscoring the growing trend toward use of phenolics by Pacific Northwest plywood makers.

for Plywood Adhesives?

On the other hand, Reichhold's plans for a 30-million-lbs./year phenol plant at Tacoma, Wash., although announced, appear indefinite now.

In the Northwest the recent resin price cut should help stimulate demand for phenolic for plywood, and concomitantly bolster phenol demand. For years, plywood producers have hoped to streamline their product line, cut inventories of both resins and plywood products. This has been hard to accomplish because of the price gap between phenolic and protein adhesives, causing plywood makers to turn out a variety of grades of plywood. The lower price will help push the plywood industry toward adoption of a single (and high) grade of phenolic-bonded plywood.

Another factor in the Northwest phenolic picture is plywood producers' moves to manufacture their own resins. Several plywood makers (e.g., Georgia-Pacific) already produce some of their own requirements and other producers are considering it. What effect this trend will ultimately have on phenolic resin markets—and phenol demand—is still uncertain.

National Outlook: While serious phenol overcapacity looms on the West Coast, the over-all domestic scene indicates a somewhat more balanced supply-demand situation. By the end of '61, capacity will have advanced to about 905 million lbs./-year (plus about 40 million lbs. from natural sources), and demand for all uses, will be about 800 million lbs./-year. Expansions under way or planned will likely push capacity to over 1.1 billion lbs. by '62 or early '63. Demand is expected to keep pace, should reach an even 1 billion lbs./-year by '65 (*see table, p. 94*).

Phenolic resins are the major outlet for phenol in the U.S. Last year phenolics consumed a whopping 400 million lbs., with molding compounds taking the lion's share — about one-third of this total.

But the outlook for phenolic molding materials is somewhat dim. These materials are facing heavy competition from new plastic materials—e.g., polycarbonates, epoxies. However, from phenol's standpoint, the situation is not entirely bleak because these newer materials utilize phenol as a raw material.

Nationally the phenolic molding compounds should be able to hang on to about 200 million lbs./year of business, barring a war or drastic change in the economy—either of which would exert a considerable influence on phenolic molding powder demand. However, while phenolic molding markets are expected to remain relatively static, other phenolic resin uses (e.g., plywood, particle board, laminates) should help keep this 40-year-old resin on its 4-5%/-year growth curve. By '65 phenolics will take about 500 million lbs./year of phenol.

Other outlets Growing: Phenol requirements for other end-uses are growing at a much faster clip. One such material is bisphenol, which consumed about 45 million lbs. of phenol last year. It will nearly triple that by '65, reach about 120 million lbs./year. Growth of epoxy and polycarbonate resins—both bisphenol derivatives—is the reason behind this rapid rise.

In '60 demand for polycarbonates reached only about 500,000 lbs. But polycarbonate makers (General Electric and Mobay) are moving rapidly to expand their markets.

The resins are finding swift acceptance in various electrical applications where design problems are critical, requiring materials with exceptional dimensional stability, heat resistance and good electrical properties. In addition, active research under way to use the resins in decorative and protective surfacings shows signs of paying off soon. In sum, demand for polycarbonate resins will likely be about 50 million lbs./year by '65, requiring about 45 million lbs./year of phenol.

The epoxies have been on the mar-

Phenol Producers and Capacities

Company & Location	Capacity (million pounds) 1961	By 1962
Allied Chemical		
Frankford, Pa.	75	100
Dow Chemical		
Midland, Mich.	220	220
Kalama, Wash.	—	36
Hercules Powder		
Gibbstown, Pa.	30	30
Hooker Chemical		
Tonawanda, N.Y.	60	60
Southshore, Ky.	60	60
Monsanto Chemical		
Avon, Calif.	35	35
Monsanto, Ill.	120	120
Chocolate Bayou, Tex.	—	75
Reichhold Chemicals		
Tuscaloosa, Ala.	90	90
Tacoma, Wash.	—	30
Schenectady Varnish Co. Rotterdam Junction, N. Y.	—	30
Shell Chemical		
Houston, Tex.	50	50
California Chemical		
Richmond, Calif.	55	55
Union Carbide Plastics		
Marietta, O.	110	110
Totals	905	1,101

Source: CW estimates.

Phenol Demand by End-Use

	(million pounds/year) '60	'65
Phenolic resins	400	500
Bisphenol	45	120
Caprolactam and adipic	90	120
Alkylated phenols	35	40
2,4,D acids	21	30
Petroleum refining	30	40
Exports	50	40
Miscellaneous	80	110
Totals	751	1,000

Source: CW estimates.

ket considerably longer than the polycarbonates, but still have not fulfilled all of their early promises. However, market demand is picking up momentum—especially for use in coatings, potting and encapsulating applications, where epoxies' superior property and performance advantages far outweigh their high price tags.

By '65 epoxy demand will probably double, to about 90 million lbs./year. Some industry optimists see a 100-million-lbs./year epoxy market by '63. This would consume about 60 million lbs. of phenol.

Caprolactam and adipic acid production are two other major phenol outlets. During '60 these two chemical consumed 90 million lbs. These end-uses have helped to account for phenol's pickup in demand in the past few years.

However, only moderate phenol demand gain in this category is anticipated over the near future. By '65, about 120 million lbs./year will be needed to satisfy domestic caprolactam and adipic acid production needs. Major reason: New processes for caprolactam—based on cyclohexane—offer more favorable economics than the traditional phenol-based process. Both Du Pont's and Dow Badische's new caprolactam units will employ the cyclohexane route.

Furthermore, future caprolactam expansion by Allied may well be based on raw materials other than phenol. For one thing, the company has licensed Snia Viscosa's toluene-based caprolactam process.

Other important phenol markets include the alkylated phenols, 2,4-D acids and petroleum refining. These uses took about 86 million lbs. of phenol in '60, and by '65 demand may move up to about 110 million lbs. No new developments are evident that would alter this outlook.

In addition, about 80 million lbs. of phenol went into a myriad of uses ranging from aspirin to germicide manufacture. This collection of miscellaneous applications should continue to register normal gains in the future, require approximately 110 million lbs. by '65.

Outlook: While a phenol overcapacity situation looms in the West, the national market picture is relatively stable. And the anticipated growth in phenol demand should narrow the demand-capacity gap.

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FLEXICHEM CS-FOOD GRADE*

(Calcium Stearate)

GENERAL PROPERTIES

Type of salt:	Di
Physical form:	Impalpable powder
Particle size:	Average 5-7 microns
Color:	White
Odor:	Bland
Bulk density:	20 lbs. per cu. ft.
Melting point:	147°-149° C. (determined by gradient bar)
Moisture:	0.6%
Iodine number:	2 maximum
Arsenic:	Less than 0.2 ppm.
Total Heavy Metals:	None detected
Solubility:	Insoluble in water, alcohols, esters and ketones. Slightly soluble in hot benzene, toluene, xylene, carbon tetrachloride, vegetable and mineral oils. Soluble in hot pyridine.

For further details, write for Bulletin No. 55

* the fatty acids used in the manufacture of this product are derived from food grade edible tallow and have passed the Chick Edema test

Flexichem CS—Food Grade—Calcium Stearate is a product of Swift & Company research. It provides all the advantages of a high quality calcium stearate in a food grade product. Flexichem CS Food Grade can be used as a conditioning agent in certain food and pharmaceutical products. It will also help solve problems in the processing of food packaging materials such as paper, plastics or rubber.

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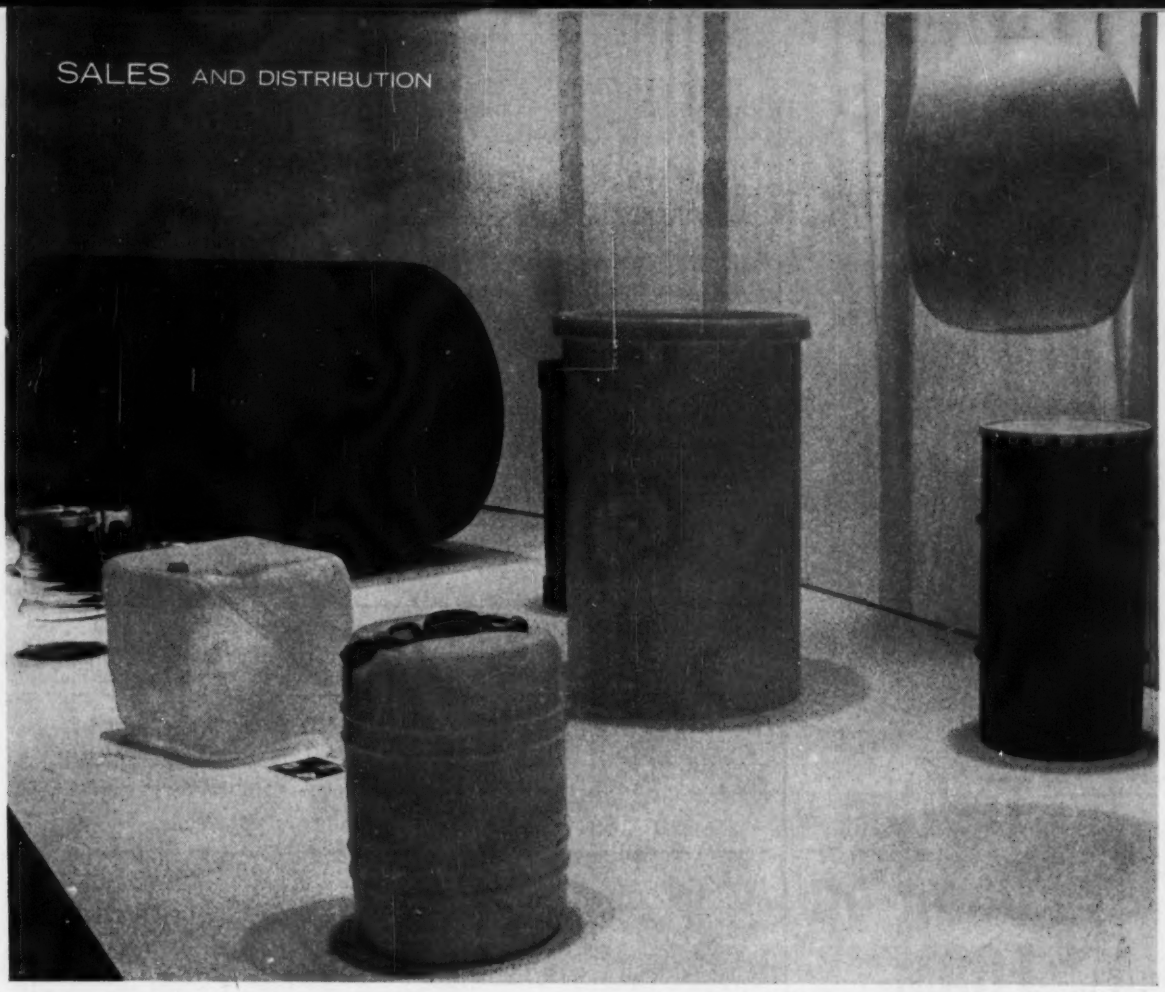


Display at packaging show illustrates some of the many plastic containers now available to CPI.

New Plastic Containers Bid for CPI Market

During the next few weeks chemical shippers will witness the inauguration of the biggest drive yet to shift the industry to use of intermediate-size (5 to 55 gal.) polyethylene packages—with added emphasis on nonreturnable, "disposable" units.

Typifying the new surge of interest in nonreturn units, Delaware Barrel & Drum (Wilmington, Del.) and Plax Corp. (Hartford, Conn.)—which until now had concentrated on returnable plastic containers—are plugging single-trip units. And Hedwin Corp. (Baltimore), most vocal supporter of the disposable polyethylene package—it makes Cubitainer (a polyethylene bag-in-a-box)—will significantly expand its output.

All this points to a double-barreled market battle in which plastic containers are not only lined up against the traditional returnable rivals, steel barrels and glass carboys, but also fighting among themselves for the nonreturnable markets.

At the Crossroads: In both these arenas, plastic containers face several problems that will have to be solved to insure good sales to chemical processors. For one thing, polyethylene, despite its key position in the new container upsurge, has definite chemical-carrying limitations; and package makers, as well as resin producers, are still seeking a resin—perhaps a hybrid—that may make PE a more satisfactory packaging material.

Moreover, bulk shipping (*CW, July 22, p. 59*), which could overshadow the whole field of unit packages, is on the upsurge. Result: experts predict polyethylene containers, now with 5% of the market, are in for a slow annual climb to an estimated 11-million-unit market.

In any case, CPI purchasing men stand to gain from this slow headway because there will be (1) more packages—in shapes ranging from boxes to cylinders—to choose from and (2) better price deals from an industry hungry for increased sales.

Looking at the Lineup: To get its share of the expanding market, Delaware Barrel & Drum recently launched a new line of single-trip polyethylene containers, tabbed the Featherweights, in 5- and 15-gal. sizes. The products are keys to the company's plans to enter the market for nonreturnables. Originally, Delaware's cylindrical polyethylene drums and liners in 5- to 55-gal. sizes were reusable returnables that were sold to distributors. DB&D's lighter-weight units, in steel and fiber overpacks, are so inexpensive that salvage of the insert is not economical. The 5-gal. units, with steel overpacks, cost $1.75-2 each in lots of 100, $2-2.25 each in smaller quantities. With fiber over-

SALES

More Polyethylene Containers for Chemicals

Company	Type	Size (gallons)	Overpack
Delaware Barrel & Drum	Old: drum liner—both returnable and single-trip New: single-trip, drum- and box-shaped liners	5, 15, 30, 55 5, 15	all types fiber steel
Plax	Old: returnable carboys New: single-trip drum liners	5, 6½, 13 5, 15	all types all types
Hedwin	Old: single-trip, box-shaped bag New: single-trip, drum- and box-shaped liners	5, 15 5, 15, 30, 55	corrugated wirebound paper-foamed plastic sandwich, others
Jones & Laughlin	Old: single-trip drum liner New: single-trip drum liner	5 10, 15, possibly 30, 55	steel steel
Plastineers	New: injection-molded returnable polyethylene drum	15	none
Plasticon	New: blow-molded returnable polyethylene drum	15	none

packs, in the same size, the tab goes down to $1.70 apiece in 1,000-unit quantities, while cost of 15-gal. steel-polyethylene composites ranges from less than $5 to about $6.

Not yet on the market but well along in development is another Delaware single-trip line: rectangular Featherweights, also in 5- and 15-gal. sizes, with corrugated jackets. This would give DB&D a line of plastic containers — both returnable and single-trip—in a variety of sizes and shapes.

Hedwin, which led the way in disposables with its Cubitainer (*CW, April 18, '59, p. 46*), also is aiming at a broad product range, will soon offer some new package shapes — e.g., 5- to 55-gal. polyethylene cylinders and 15-gal. cubes. (The reason for the one-size only in the latter: box-shaped containers are hard to handle in larger sizes, cannot be moved by rolling.) Hedwin has also come up with some new overpack constructions, notably Foamcore, a foamed polystyrene layer, sandwiched between kraft, which increases moisture resistance and gives better protection from mechanical abuse.

Plax hasn't yet revealed what its exact plans are, but does say that it will offer new nonreturnable polyethylene drums in the standard 5- and 15-gal. sizes. Although Plax has supplied Jones & Laughlin Steel Co. with plastic liners for J&L's Jaliner (throwaway polyethylene bag in a steel pail), the drums will mark Plax's first entry into the single-trip field on its own.

Plax has relied almost entirely on its returnable polyethylene carboys (capacities: 5, 6½, 13 gal.), modeled after the CPI's traditional workhorse, the glass carboy. In another move, the firm will supply J&L with inserts for 10- and 15-gal. Jaliners, and both are continuing research on possibilities of 30- and 55-gal. sizes.

Returnables' Return: But these brand-new lines of nonreturnables will have to share CPI sales. Plastic package makers face tough competition from the steel barrel industry, which, according to the Steel Shipping Container Institute, aims at reducing drum steel thickness to 28 gauge; drums made with this steel may be offered within a year or so. And already 24-gauge drums (the lower the gauge number, the heavier the steel) are scheduled to debut this fall (*CW, July 1, p. 26*).

Reusable Plastics: What about plastic returnables of the kind typified

by Plax Corp.'s carboys? Packaging experts say returnable polyethylene units won't show a real plus in the shipper's view until they present clear savings. They trace the single-tripper's new prominence to the fact that hard figures on the performance of returnables are not easy to come by. From this springboard, manufacturers of nonreturnable containers jump, with some good reason, to the conclusion that it may well be cheaper to use single-trip units. They reason that the lightweight plastic units are low in first cost, economical to ship —pluses so clear they outweigh the advantages of using returnable units.

But this last factor leads to the old questions: How do CPI shippers determine what it really costs to package and distribute a product in a returnable container? What about the extra bookkeeping for both the distributor and purchaser, the price of cleaning, renovation, storage? Packaging experts have yet to come up with any definitive answers.

And in this "grey area," then, there's an opening for novel merchandising—and it seems to have been taken by two firms, Plastineers Corp. and Plasticon Corp. (both in Minneapolis). In the past few months both have brought out polyethylene containers that have been approved—temporarily, at least—by the Interstate Commerce Commission for shipment without overpacks. They both promise stiff competition for disposable units.

Of the two, Plastineers currently appears to have an edge, since it has already sent its 15-gal. drum through more than 50 round trips and reports the container is "good for many more." The firm's most impressive point: the cost of this poly package, now quoted at $17.95 each in orders of 15 or more, will average less than the cost of disposables after about a dozen uses. Furthermore, management emphasizes, all of Plastineers' output is sold outright, eliminating deposit charges.

While Plastineers was the first to produce an industrial polyethylene package for use without an overpack, Plasticon followed quickly with the first such blow-molded unit—which may prove to be less costly. But because production began just three weeks ago, Plasticon has no units available for industrial consumption, although the price has been set at from $10-$14 for a 15-gal. unit. Specifications: tare weight, 8 lbs.; wall thickness, 1/10 to 1/4 in.

ICC's Western Classification Committee has so far put off ruling whether Plastineers' injection-molded container, which uses Union Carbide resin, can be used as a chemical drum. The company is banking on its acceptance in such widely varying markets as beer, acid and milk shipments to insure commercial success.

But other container makers and users seem skeptical of these newcomers' chances. For one thing, cleaning polyethylene units — something that would have to be done after every trip with the Plastineers and Plasticon models—is a tricky matter. The resin's permeability and porosity mean that the packages could not be washed without some fear of polluting the next product shipped.

Problems and Answers: This leads to a basic problem with polyethylene itself that has plagued both returnable and nonreturnable containers: the resin's suitability for chemicals. Stress-cracking, flaking, discoloration have caused trouble. Some of the problems have been solved, but purchasing men are more wary now about the claims for polyethylene packages. And one other difficulty that has hampered plastic container growth has been the restrictions of a "split-industry" package, where a firm like Hedwin, for example, must go to steel firms for its steel overpacks and to fiber firms for its fiber overpacks.

However, all this may be resolved with the help of the military, already a big consumer of polyethylene containers. The Army Ordnance Corps, working through its Rosford Arsenal in Toledo, O., is conducting full-scale tests on plastic packages. The test windup is expected this fall. The Army's aim: to set up specifications to make containers and overpacks interchangeable for worldwide military use. Meanwhile, ICC is—independently—doing nearly the same thing for industrial consumers. Ultimate result could be a standard design for polyethylene containers in two years.

Rosy Future: Both these test programs could easily brighten the already healthy prospects for polyethylene containers. Delaware Barrel & Drum, formed in '51, is already a strong contender in the packaging

field; its sales have increased at least 35% each year in the past 10 years. DB&D has expanded its present Wilmington plant from 45,000 sq. ft. to 215,000 sq. ft. and is looking for its second plant site outside the Wilmington area. It will come out with its first public stock offering in 60 to 90 days.

And Plax shows first-half income of $14.5 million, up nearly 11% over the $12.8 million reported for the same period in '60. The over-all production of polyethylene containers, for every use, say trade experts, will jump an estimated 20% in '61, to 2.4 million units.

All this hints that polyethylene containers still stand as the most dynamic of the industrial packages, and with the rough-and-tumble battle between returnables and nonreturnables picking up, there's no sign of a change.

Trainload of Savings?

Would it be possible to haul western Canada's surplus sulfur stock, which is now piling up from "sour gas" purification, cheaply enough to permit it to compete in U.S. markets with Gulf Coast material?

Yes, claims John Kneiling, staff consultant to Theodore J. Kauffeld, New York consulting engineering firm—if it were hauled via his proposed "bulk train." The transport plan, designed to handle up to 25,000 tons of material at a time, is being studied by Kauffeld for 35 Eastern railroads.

The train would be set up as an integrated railroad carrier—incorporating cars and power in one package —to move as a unit. Best feature: it would make no stops for unloading from the time it left its point of origin until it reached its destination, where specially designed terminals would handle its cargo.

Eight Engines: As Kneiling describes it, the bulk train would be made up of about 250 cars, permanently connected in blocks of four to seven, with eight 2,500-hp. propulsion units working in pairs and placed midway between groups of 60 cars. Fuel, water and lube oil, carried on board, could cut out servicing stops.

All these points might open U.S. chemical outlets to Canadian sulfur. Kneiling maintains that Canadian sulfur does not move into eastern U.S. areas now because of conventional—and prohibitive—freight costs. He estimates that a $10-million/year profit over a 10-year period could be realized if some venturesome Canadian firm took up his idea. Going a step further, he predicts that the sulfur would cost East Coast purchasers not much more than $6/ton, about one-third to one-quarter the current price.

Deadheading? But management of the big U.S. producers, Texas Gulf Sulphur and Freeport Sulphur, dismiss the theory as far-fetched. Although the producers agree that the bulk train idea is feasible as a basic transport plan, they point out that Canadian exporters, using present shipping methods, cannot yet sell close to the $27/ton quoted for sulfur in the Great Lakes region. (Freight cost alone, Alberta to Chicago: $12.88/long ton.) And, of course, costs to the East Coast are even higher. Moreover, marketing men note, some arrangement would have to be made to refill the empty cars, once the sulfur reached its purchasers, to avoid "deadheading" back to the sulfur source. Finally, this move into the domain of the Gulf Coast producer might draw heavy competitive pricing fire.

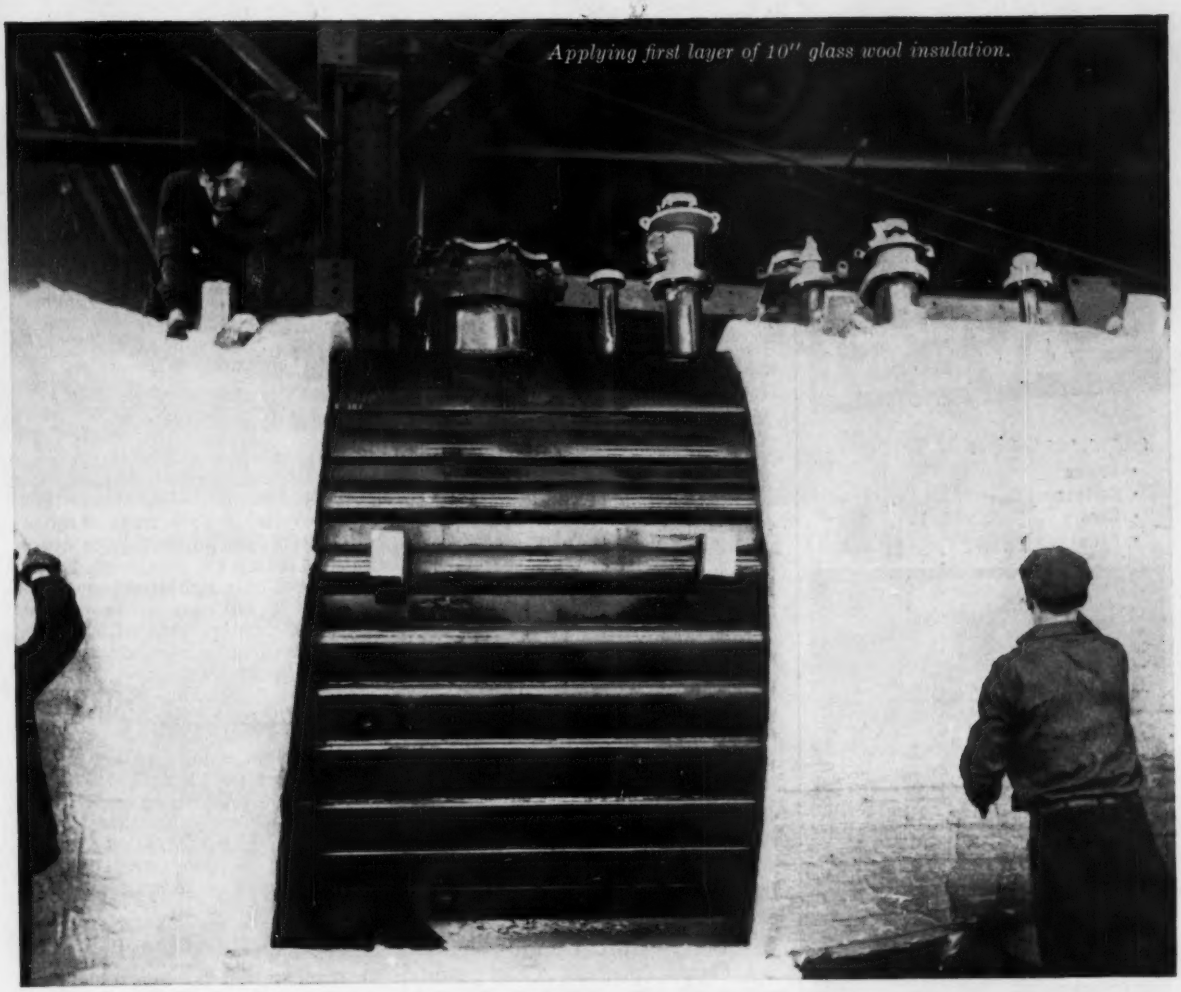
Whether or not Kneiling's idea ever goes into effect, it marks the second off-beat look at sulfur distribution this year. The other: casting molten sulfur into the shape of a submarine for inland water shipment (*CW, Feb. 25, p. 76*).

More Plastic Tubes

Thatcher Glass Manufacturing Co. — pioneer producer of squeeze-type polypropylene tubes — has licensed Peerless Tube Co., maker of collapsible metal tubes and aluminum aerosol containers, to use its processes to make plastic squeeze tubes.

Under the agreement, Peerless will produce tubes of high- and low-density polyethylene, vinyl and polypropylene — items that will continue to be made by Thatcher's Plastic Tube Division.

Thatcher recently disclosed the completion of a $1.2-million expansion program for its plastic tube plant at Muscatine, Iowa, and Peerless has begun a $500,000 expansion of its Bloomfield, N.J., facilities.



Applying first layer of 10" glass wool insulation.

GATX TANK CARS KEEP THE HEAT ON CAPROLACTAM

General American Develops a Tank Car to Transport a Problem Liquid that "Freezes" at +156°F

Caprolactam is a difficult liquid to transport, because it "freezes" and becomes a solid if allowed to "cool off" to +156°F. To protect caprolactam and deliver it rapidly and safely, special 10,000-gallon tank cars (on roller bearing trucks) have been engineered by General American. These cars are insulated with 10-inch blankets of glass wool, and equipped with 22 lines of inside-outside heating coils. Caprolactam is loaded at +176° into stainless steel tank cars. Inert gas is then pumped in to prevent contact with the atmosphere. All these help deliver caprolactam in a liquid state. A 3-inch circulating line can provide action to facilitate unloading.

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Waterways Activity Up

New facilities along the nation's inland waterways are being added at a fast clip, according to the American Waterways Operators. During '61's second quarter, 129 new facilities (plants and wharves) were announced or started, a sizable jump from the year-earlier total of 56.

Chemical process companies' dockside plants or barge wharves account for 43 of the new projects: chemical, 28; rubber, 4; paper, 8; and cement, 3.

The pace is so brisk that first-half '61 waterside projects—about 249—are nearly equal to last year's total construction.

DATA DIGEST

• **Cation Exchanger:** Booklet presents data on properties and applications of sulfonated polystyrene cation-exchange resin for water demineralization. Ionac Chemical Corp. (Birmingham, N.J.).

• **Rhenium:** New, 12-page brochure illustrates fabrication, applications, price and varieties of rhenium and rhenium alloys. Likely uses: electronics, missile development, nucleonics. Rhenium Division, Chase Brass & Copper Co. (Waterbury, Conn.).

• **Phenol:** Six-page folder gives guides for designing with phenolic molding compounds, lists typical applications and design properties and compares cost with that of common metals. Chemical Materials Dept., General Electric (Pittsfield, Mass.).

• **Marketing Research:** New, 94-page book lists key information sources for marketing research and economic forecasting, covers the chemical and rubber industries among others. Cost: $3.75. American Management Assn. (1515 Broadway, New York 36, N.Y.).

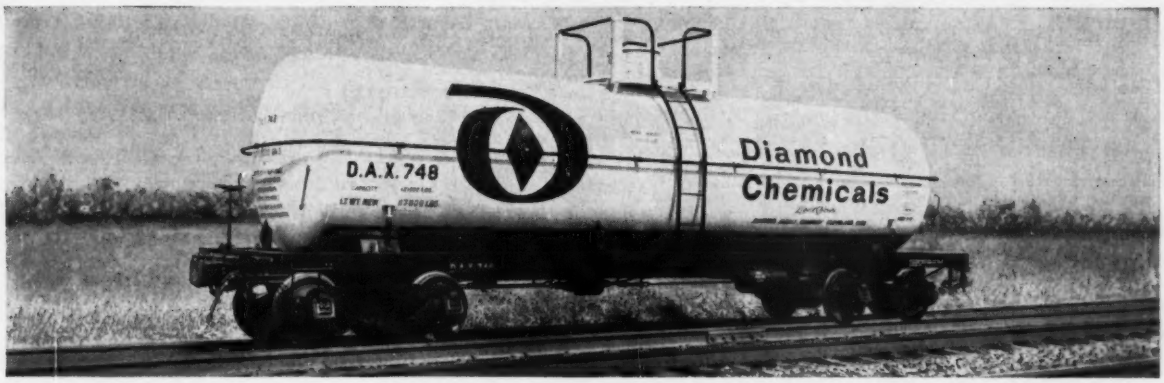
• **Adhesives:** Booklet outlines company's adhesives products and services. Adhesives Products Corp. (1660 Boone Ave., New York 60, N.Y.).

• **Polypropylene Monofilament:** New, 16-page report discusses the extrusion process and end-product properties attainable in converting polypropylene into monofilament. Eastman Chemical Products, Inc. (Kingsport, Tenn.).

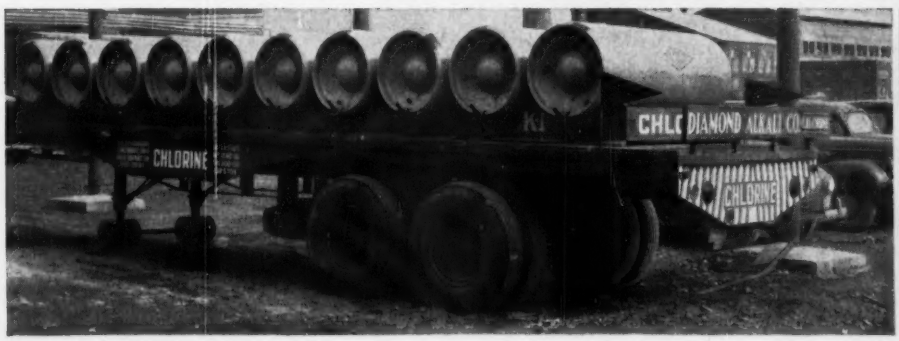
• **Emulsifiers:** Brochure presents list of emulsifiers designed for use with oils or solvents and water. Son-

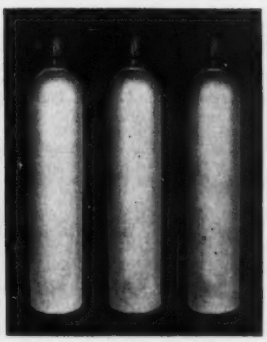
Diamond delivers the Chlorine

by inland waterway...by the bargeload



by tank cars...or by the cylinder or container





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neborn Chemical and Refining Corp. (300 Park Ave., New York 10, N.Y.).

• **Plating Chemicals:** Bulletin describes chemicals for electroplating and metal finishing, including salts and brighteners offered by Hanson-Van Winkle-Munning Co. (Matawan, N.J.).

• **Processing Chemicals:** Bulletin lists company's line of surfactants, defoamers, water-soluble lubricants and resins, textile softeners, resin and wax emulsions, soaps, stabilizers, inorganic and fine chemicals and urethane cellular plastics. Nopco Chemical Co. (60 Park Place, Newark, N.J.).

• **Handling Methyl Chloride:** Brochure describes safe handling, storage and use of methyl chloride in liquid form. Chemical Products Division, Ansul Chemical Co. (Marinette, Wis.).

• **Plasticizers in Coatings:** New, 54-page booklet presents data on use of plasticizers in wide range of protective coatings. Booklet contains several chapters on plasticizers in cellulosic coatings, vinyls, rubber coatings as well as one on a variety of coatings using synthetic resins—e.g., epoxies, acrylics, silicones, phenolics and melamine.

It also discusses other company products used in coatings: antioxidants, resin additives, preservatives, flatting and thickening agents and odor-masking agents. Organic Chemicals Division, Monsanto Chemical Co. (St. Louis, Mo.).

• **Silicone Molding Compounds:** Brochure illustrates facilities and services available to customers buying silicone molding compounds. Dept. W.T.R., Dow Corning Corp. (Midland, Mich.).

• **UV Light Absorber:** Data sheet describes properties and uses of Tinuvin 326, a substituted hydroxyphenyl benzotriazole designed to reduce ultraviolet radiation damage of polyolefins and related polymers. Geigy Chemical Corp. (Ardsley, N.Y.).

• **Polyvinyl Acetate:** New, 40-page manual outlines properties and uses of family of polyvinyl acetate resins, emulsions, solutions and powders. Shawinigan Resins Corp. (Springfield 1, Mass.).

• **Products Catalog:** Booklet lists the 75 chemical products available from Valchem Division, United Merchants & Manufacturers, Inc. (1407 Broadway, New York 18, N.Y.).

Tracers

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Sales Engineers-Process Engineers! Opportunities for both Sales and Process Engineers with medium size engineering-construction company which designs and builds equipment and entire plants for the chemical process industry. Must have chemical engineering degree and not less than five years experience in design and/or operation of chemical process plants. Special knowledge desirable in distillation and high pressure technology. Process Engineer applicants should have healthy curiosity about processes, ability to calculate material and heat balances, knowledge of practical pre-design, and ability to prepare estimates. Send detailed resume outlining education, experience and salary requirements to: Manager of Personnel, Vulcan-Cincinnati, Inc., 120 Sycamore Street, Cincinnati 2, Ohio.

Chemist For Paper Mill Industry-Experience in Coatings, Plastics, etc. desirable. Need customer-contact personality with technical proficiency. Good salary to start, provided you are authoritative, productive and ambitious . . . provided you are capable of creative and applied Chemistry . . . provided . . . you take it from there. What can you do for this success-slanted, modest-sized firm in a lovely New England area (ideal for family life, by the way). Fill the bill, and your future can be great. To awaken our interest, write in detail to P-7284, Chemical Week.

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Advertising Salesman Wanted: A rare opportunity to represent an outstanding business publication and work for a leading publishing organization in New York City and vicinity. Chemical sales experience, chemical production experience or advertising space sales experience desirable. Write, in confidence, to SW-7253, Chemical Week.

Salesmen-The Industrial Chemicals Division of Spencer Chemical Company is in immediate need of a man with a minimum of five years industrial and organic sales experience. New York location. This man should have a technical degree and be familiar with organic chemicals, latexes, polymers and industrial chemicals. Also other openings are available in Market Development and Sales for men with sales experience in the chemical, latex or textile fields. Please send complete resume to: Personnel Manager, Spencer Chemical Company, 610 Dwight Building, Kansas City, Missouri.

POSITION WANTED

Available soon-Chemical Engineer Degree-Experienced in R&D on metal plating cleaners, dairy products, drawing compounds, maintenance cleaners, etc. Have experience in purchasing, production scheduling, customer service, shipping and billing procedures, and detergent applications. PW-7156, Chemical Week.

MISCELLANEOUS

To Employers Who Advertise for Men: The letters you receive in answer to your advertisements are submitted by each of the applicants with the hope of securing the position offered. When there are many applicants it frequently happens that the only letters acknowledged are those of promising candidates. (Others do not receive the slightest indication that their letters have even been received, much less given any consideration.) These men often become discouraged, will not respond to future advertisements and sometimes even question if they are bona fide. We can guarantee that Every Advertisement Printed Is Duly Authorized. Now won't you help keep our readers interested in this advertising by acknowledging every application received, even if you only return the letters of unsuccessful applicants to them marked say, "Position filled, thank you." If you don't care to reveal your identity, mail them in plain envelopes. We suggest this in a spirit of helpful co-operation between employers and the men replying to Positions Vacant advertisements. Classified Advertising Division, McGraw-Hill Publishing Company. "Put Yourself in the Place of the Other Fellow."

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Need Vacuum Drying? Vacuum shelf dryer time available for next 6-8 months. Northern New Jersey location. Reply SS-7144, Chemical Week.

BOOKS

For recovery of precious metals catalysts, solutions send for recovery schedule. Precious Metals Recovery Corp., 85 River Road, Nutley 10, New Jersey.

EQUIPMENT FOR SALE

Multi-million dollar chemical plant at North Little Rock, Ark. Stainless Steel & glass-lined equip. Send for detailed circular. Perry, 1415 N. 6th St., Phila. 22, Pa.

Buflovak 42" x 120" double drum dryer, ASME code drums 160 psi WP, complete. Perry, 1415 N. 6th St., Phila. 22, Pa.

Pfaudler 1250 gal. blue-glass lined jacketed reactor, 72" x 72", Agit. Perry, 1415 N. 6th St., Phila. 22, Pa.

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3" all SS Viking, Moyno or Quimby positive displacement pump. W-7283, Chemical Week.

SS Heat Exchanger 600-800 sq. ft. range. W-7282, Chemical Week.

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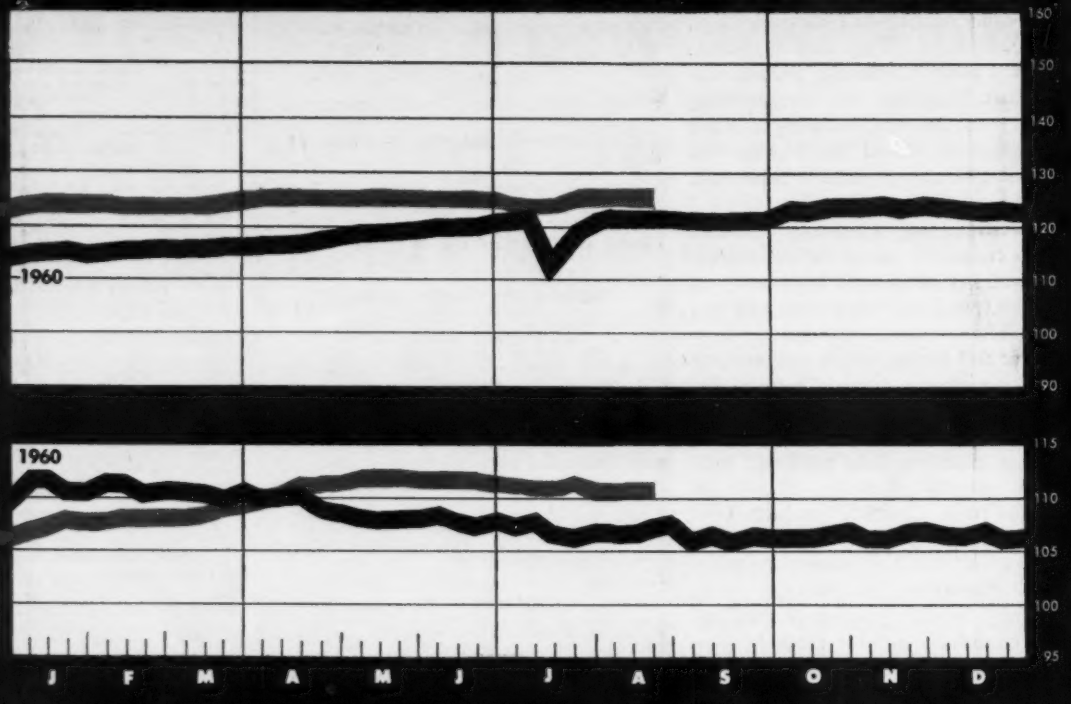

AUGUST 19, 1961

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1957=100)	125.1	125.2	123.0
Chemical Week wholesale price index (1947=100)	111.0	111.0	108.0
Stock price index (12 firms, Standard & Poor's)	55.45	55.34	47.96
Steel ingot output (thousand tons)	1,850	1,818	1,537
Electric power (million kilowatt-hours)	16,137	16,061	15,125
Crude oil and condensate (daily av., thousand bbls.)	7,024	6,945	6,837

TRADE INDICATORS (billion dollars)	MANUFACTURERS' SALES			MANUFACTURERS' INVENTORIES		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All Manufacturing	30.94	30.78	30.78	53.35	53.37	55.10
Chemicals and Allied Products	2.49	2.47	2.35	4.25	4.24	4.11
Petroleum and Coal Products	3.26	3.31	3.18	3.38	3.37	3.30
Paper and Allied Products	1.18	1.16	1.05	1.67	1.66	1.59
Textile Products	1.27	1.22	1.27	2.74	2.76	2.70

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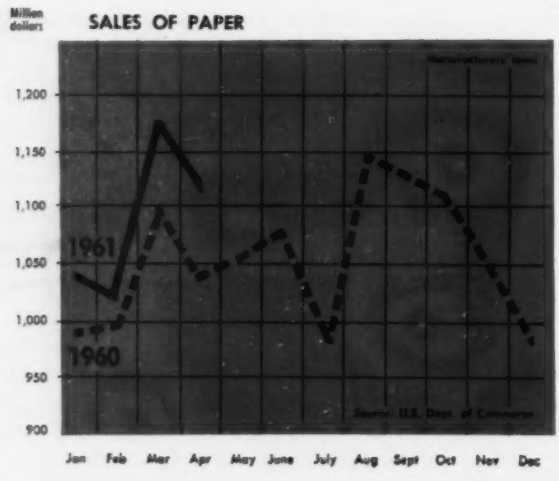

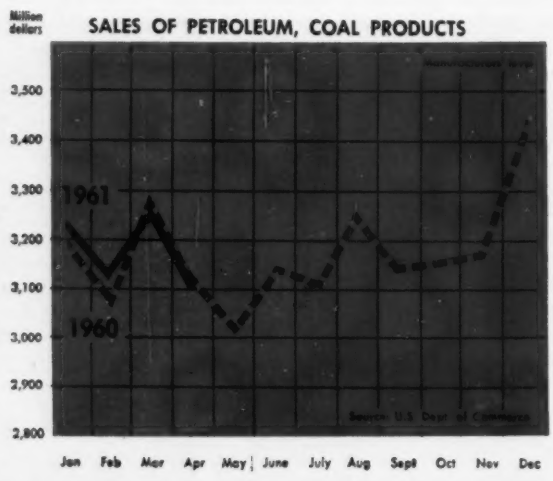

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- **Anticaking agent** — sulfur, insecticides
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